



Engineering and Consulting, Inc.
511 Congress Street
P.O. Box 7050
Portland, Maine 04112-7050
Telephone: 207/775-5401
Fax: 207/772-4762
Home Page: www.mactec.com

To: Steve Morrow
From: Chris Ricardi
Date: April 8, 2010
Subject: Interim Response Steps Work Plan Slurry Wall Monitoring Program 4Q09– November 2009

**DATA VALIDATION REPORT
NOVEMBER 2009 SLURRY WALL SURFACE WATER AND GROUNDWATER
NOVEMBER 2009 SEDIMENT
OLIN CHEMICAL SUPERFUND SITE
WILMINGTON, MASSACHUSETTS
TestAmerica Laboratories Data Sets 360-25552-1, 360-25553-1 and 360-25577-1**

1.0 INTRODUCTION

Groundwater samples, surface water, and sediment samples were collected from the Olin Chemical Superfund Site from November 9 to November 12, 2009. Samples were analyzed by TestAmerica Laboratories in Westfield, Massachusetts. Data were reported in sample delivery groups (SDGs) 360-25552, 360-25553 and 360-25577. A summary of samples included in this review is contained in Table 1. Samples reviewed in this report were analyzed for the following USEPA SW-846 (USEPA, 1996), USEPA wastewater (USEPA, 1993), or Standard Methods (APHA, 1995):

- dissolved metals (aluminum and chromium) by USEPA Method 6010B in groundwater
- dissolved and total metals (aluminum, chromium, and sodium) by USEPA Method 6010B in surface water
- total metals (aluminum, chromium, and sodium) by USEPA Method 6010B in sediment
- general chemistry analyses for ammonia by USEPA Method 350.1 (Lachat 10-107-06-1), chloride, sulfate, nitrate, and nitrite by USEPA Method 300, and specific conductance by SM18 SM 2510B

The Draft Interim Response Steps Work Plan (MACTEC, 2007) and the MassDEP Compendium of Quality Assurance and Quality Control Requirements and Performance Standards for Selected Analytical Methods Used in Support of Response Actions for the Massachusetts Contingency Plan (MCP) [MassDEP, 2004] were used as references during the review. Analytical packages were reviewed using the Level 1 Data Quality Evaluation checklists that were developed for the Olin Wilmington annual and quarterly groundwater monitoring tasks. Final sample results are presented on data summaries in Table 2.

2.0 METALS

Data were reviewed for the following parameters:

- * Data Completeness
- * Holding Time
- * Blanks
- * Matrix Spike Analysis
- * Field Duplicate Results

- * Laboratory Control Sample/Laboratory Control Sample Duplicate Analysis
- * Detection Limits
- Dissolved vs. Total Metals Comparison

* = indicates that criteria were met for this parameter

Blanks

The laboratory qualified sample results for iron with a (B) indicating it was detected in the sample and associated method blank in sediment SDG 360-25553. The concentrations in all samples were much higher than concentration in the blank, and the B qualifiers were removed from iron results in the final data set.

Dissolved vs. Total Metals Comparison

Dissolved sodium concentrations are significantly greater than total sodium concentrations reported in a subset of surface water samples in SDG 360-25577. The results for total and dissolved sodium in samples OC-SW-ISCO1, OC-SW-ISCO2, OC-SW-ISCO3, OC-SW-PZ16RR, OC-SW-PZ17RR, OC-SW-18R, and OC-SW-18R-DUP were qualified estimated J.

3.0 GENERAL CHEMISTRY – Ammonia, Chloride, Sulfate, Nitrate, Nitrite, and Specific Conductance

Data were reviewed for the following parameters:

- * Data Completeness
- * Holding Time
- * Blanks
- Matrix Spike Analysis
- * Laboratory Duplicate Analysis
- * Laboratory Control Sample/Laboratory Control Sample Duplicate Analysis
- Detection Limits

* = indicates that criteria were met for this parameter

Matrix Spike Analysis

An ammonia MS/MSD analysis was completed using sample OC-SW-18R. The ammonia MS percent recovery (55) is below than the project limit of 75 percent. The MSD recovery was within limits indicating variability of recovery was observed. The results for ammonia in all surface water samples were qualified estimated (J).

Detection Limits

The reporting limits for nitrite in samples OC-SW-PZ16RR, OC-SW-PZ17RR, and OC-SW-SD17 are elevated above the project goal of 0.01 mg/L to 0.1 mg/L due to a 10X dilution.

Except for the validation actions noted above, the results are interpreted to be usable as reported by TestAmerica.



4/8/10

Chris Ricardi, NRCC-EAC
Senior Chemist

Date

Michael Murphy
Project Principal

Date

4/21/10

References:

- American Public Health Association (APHA), 1995. "Standard Methods for Examination of Water and Wastewater"; 19th Edition; APHA, 1015 Fifteenth St., NW. Washington, D.C. 20005.
- MACTEC, 2007. "Draft Interim Response Steps Work Plan"; Olin Chemical Superfund Site; 51 Eames Street, Wilmington, Massachusetts; July 25, 2007.
- Massachusetts Department of Environmental Protection (MassDEP), 2004. "The Compendium of Quality Assurance and Quality Control Requirements and Performance Standards for Selected Analytical Methods Used in Support of Response Actions for the Massachusetts Contingency Plan (MCP)"; Bureau of Waste Site Cleanup; 1 Winter Street, Boston, Massachusetts 02108; WSC-CAM; May 2004.
- U.S. Environmental Protection Agency (USEPA), 1993. "Methods for Chemical Analysis and Water and Wastes (MCAWW)", EPA/600/4-79-020 (March 1983) with updates and supplements EPA/600/4-91-010 (June 1991), EPA/600/R-92-129 (August 1992) and EPA/600/R-93-100 (August 1993).
- U.S. Environmental Protection Agency (USEPA), 1996. "Test Methods for Evaluating Solid Waste"; Laboratory Manual Physical/Chemical Methods; Office of Solid Waste and Emergency Response; Washington, DC; SW-846; November 1986; Revision 4 -December 1996.

Table 1
Sample Summary - 360-25552-1, 360-25577-1, & 360-25553-1
Data Validation Report
November 2009 Slurry Wall / Cap Groundwater, Surface Water and Sediment
Olin Chemical Superfund Site
Wilmington, Massachusetts

				SW846 6010B	SW846 6010B	E350.1	40CFR136A		
				Total	Filtered	(QuickChem 10-107-06-1-B)	SM 2510B	300.0	E160.3
SDG	Location	Sample ID	Sample Date						
Groundwater									
360-25552-1	GW-10S	OC-GW-10S	11/10/2009		2	1	1	2	
360-25552-1	GW-201S	OC-GW-201S	11/9/2009		2	1	1	2	
360-25552-1	GW-202D	OC-GW-202D	11/11/2009		2	1	1	2	
360-25552-1	GW-202S	OC-GW-202S	11/11/2009		2	1	1	2	
360-25552-1	GW-202S	OC-GW-202S DUP	11/11/2009		2	1	1	2	
360-25552-1	GW-24	OC-GW-24	11/10/2009		2	1	1	2	
360-25552-1	GW-25	OC-GW-25	11/10/2009		2	1	1	2	
360-25552-1	GW-26	OC-GW-26	11/10/2009		2	1	1	2	
360-25552-1	GW-34D	OC-GW-34D	11/11/2009		2	1	1	2	
360-25552-1	GW-34D	OC-GW-34D DUP	11/11/2009		2	1	1	2	
360-25552-1	GW-34SR	OC-GW-34SR	11/11/2009		2	1	1	2	
360-25552-1	GW-35S	OC-GW-35S	11/11/2009		2	1	1	2	
360-25552-1	GW-42S	OC-GW-42S	11/9/2009		2	1	1	2	
360-25552-1	GW-76S	OC-GW-76S	11/10/2009		2	1	1	2	
360-25552-1	GW-78S	OC-GW-78S	11/11/2009		2	1	1	2	
360-25552-1	GW-79S	OC-GW-79S	11/10/2009		2	1	1	2	
360-25552-1	GW-CA1	OC-GW-CA-1	11/11/2009		2	1	1	2	
360-25552-1	PZ-16RR	OC-PZ-16RR	11/10/2009		2	1	1	2	
360-25552-1	PZ-17RR	OC-PZ-17RR	11/10/2009		2	1	1	2	
360-25552-1	PZ-18R	OC-PZ-18R	11/10/2009		2	1	1	2	
Surface Water									
360-25577-1	PZ-18R	OC-SW-18R	11/12/2009	3	3	1	1	4	
360-25577-1	PZ-18R	OC-SW-18R-DUP	11/12/2009	3	3	1	1	4	
360-25577-1	ISCO1	OC-SW-ISCO1	11/12/2009	3	3	1	1	4	
360-25577-1	ISCO2	OC-SW-ISCO2	11/12/2009	3	3	1	1	4	
360-25577-1	ISCO3	OC-SW-ISCO3	11/12/2009	3	3	1	1	4	
360-25577-1	PZ-16RR	OC-SW-PZ16RR	11/12/2009	3	3	1	1	4	
360-25577-1	PZ-17RR	OC-SW-PZ17RR	11/12/2009	3	3	1	1	4	
360-25577-1	SD-17	OC-SW-SD17	11/12/2009	3	3	1	1	4	
Sediment									
360-25553-1	SD-SD1	OC-SD-SD-SD1-0.0/0.5	11/11/2009	3					2
360-25553-1	SD-SD1	OC-SD-SD-SD1-0.0/0.5 DUP	11/11/2009	3					2
360-25553-1	SD-SD2	OC-SD-SD-SD2-0.0/0.5	11/11/2009	3					2
360-25553-1	SD-SD3	OC-SD-SD-SD3-0.0/0.5	11/11/2009	3					2
360-25553-1	SD-SD4	OC-SD-SD-SD4-0.0/0.5	11/11/2009	3					2
360-25553-1	SD-SD5	OC-SD-SD-SD5-0.0/0.5	11/11/2009	3					2

Notes:

Number listed under method indicates number of target analytes reported.

Prepared by / Date: KJC 11/30/09

Checked by / Date: CSR 3/23/10

Table 2
Final Results Summary - 360-25552-1, 360-25577-1, & 360-25553-1
November 2009 Slurry Wall / Cap Groundwater, Surface Water and Sediment
Olin Chemical Superfund Site
Wilmington, Massachusetts

				Loc Name		GW-10S		GW-201S		GW-202D		GW-202S		GW-202S		GW-24		GW-25	
				Field Sample ID		OC-GW-10S		OC-GW-201S		OC-GW-202D		OC-GW-202S		OC-GW-202S DUP		OC-GW-24		OC-GW-25	
				Field Sample Date		11/10/09		11/09/09		11/11/09		11/11/09		11/11/09		11/10/09		11/10/09	
				QC Code		FS		FS		FS		FS		FD		FS		FS	
				Lab Sample Delivery Group		360-25552-1		360-25552-1		360-25552-1		360-25552-1		360-25552-1		360-25552-1		360-25552-1	
Frac	Method	Analyte	Units	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
F	SW6010	Aluminum	ug/l	4300		100 U		11000		100 U		100 U		100 U		100 U		100 U	
F	SW6010	Chromium	ug/l	5 U		11		770		4.8 J		4.2 J		5 U		1.6 J			
N	E300	Chloride	mg/l	31		60		250		45		51		6.5		63			
N	E300	Sulfate	mg/l	130		1300		1700		380		390		62		100			
N	LACH_107_06_1_B	Nitrogen, as Ammonia	mg/l	7.8		130		260		69		67		38		41			
N	SM2510B	LAB SPECIFIC CONDUCTANCE	umhos/cm	390		2800		4000		1210		1240		360		640			

Notes:

N = normal

F = filtered

FS = field sample

FD = field duplicate

U = not detected, value is the detection limit

J = value is estimated

ug/l = microgram per liter

mg/l = milligram per liter

umhos/cm = micro reciprocal ohms per centimeter

Table 2
Final Results Summary - 360-25552-1, 360-25577-1, & 360-25553-1
November 2009 Slurry Wall / Cap Groundwater, Surface Water and Sediment
Olin Chemical Superfund Site
Wilmington, Massachusetts

				Loc Name		GW-26		GW-34D		GW-34D		GW-34SR		GW-35S		GW-42S		GW-76S	
				Field Sample ID		OC-GW-26		OC-GW-34D		OC-GW-34D DUP		OC-GW-34SR		OC-GW-35S		OC-GW-42S		OC-GW-76S	
				Field Sample Date		11/10/09		11/11/09		11/11/09		11/11/09		11/11/09		11/09/09		11/10/09	
				QC Code		FS		FS		FD		FS		FS		FS		FS	
				Lab Sample Delivery Group		360-25552-1		360-25552-1		360-25552-1		360-25552-1		360-25552-1		360-25552-1		360-25552-1	
Frac	Method	Analyte	Units	Result		Qual		Result		Qual		Result		Qual		Result		Qual	
F	SW6010	Aluminum	ug/l	100 U				100 U				100 U		100 U		260		100 U	
F	SW6010	Chromium	ug/l	6.9				14		14		5 U		19		6.6		2 J	
N	E300	Chloride	mg/l	18				15		15		1.2		7		44		3.1	
N	E300	Sulfate	mg/l	68				29		29		8		190		6.4		35	
N	LACH_107_06_1_B	Nitrogen, as Ammonia	mg/l	28				16		15		0.24		23		0.21		8.3	
N	SM2510B	LAB SPECIFIC CONDUCTANCE	umhos/cm	360				210		210		83		710		220		150	

Notes:

N = normal

F = filtered

FS = field sample

FD = field duplicate

U = not detected, value is the detection limit

J = value is estimated

ug/l = microgram per liter

mg/l = milligram per liter

umhos/cm = micro reciprocal ohms per centimeter

Table 2
Final Results Summary - 360-25552-1, 360-25577-1, & 360-25553-1
November 2009 Slurry Wall / Cap Groundwater, Surface Water and Sediment
Olin Chemical Superfund Site
Wilmington, Massachusetts

				Loc Name		GW-78S		GW-79S		GW-CA1		PZ-16RR		PZ-17RR		PZ-18R	
				Field Sample ID		OC-GW-78S		OC-GW-79S		OC-GW-CA-1		OC-PZ-16RR		OC-PZ-17RR		OC-PZ-18R	
				Field Sample Date		11/11/09		11/10/09		11/11/09		11/10/09		11/10/09		11/10/09	
				QC Code		FS		FS		FS		FS		FS		FS	
				Lab Sample Delivery Group		360-25552-1		360-25552-1		360-25552-1		360-25552-1		360-25552-1		360-25552-1	
Frac	Method	Analyte	Units	Result		Qual		Result		Qual		Result		Qual		Result	
F	SW6010	Aluminum	ug/l	100		U		100		U		100		U		100	
F	SW6010	Chromium	ug/l	2.1		J		8.9		3.3		6.5		3		13	
N	E300	Chloride	mg/l	22				210		6		190		18		79	
N	E300	Sulfate	mg/l	540				1400		86		970		470		80	
N	LACH_107_06_1_B	Nitrogen, as Ammonia	mg/l	61				190		1.1		230		58		26	
N	SM2510B	LAB SPECIFIC CONDUCTANCE	umhos/cm	1300				3400		600		3000		1400		570	

Notes:

N = normal

F = filtered

FS = field sample

FD = field duplicate

U = not detected, value is the detection limit

J = value is estimated

ug/l = microgram per liter

mg/l = milligram per liter

umhos/cm = micro reciprocal ohms per centimeter

Prepared by / Date: KJC 03/23/10

Checked by / Date: CSR 3/23/10

Table 2
Final Results Summary - 360-25552-1, 360-25577-1, & 360-25553-1
November 2009 Slurry Wall / Cap Groundwater, Surface Water and Sediment
Olin Chemical Superfund Site
Wilmington, Massachusetts

				Loc Name		ISCO1		ISCO2		ISCO3		PZ-16RR		PZ-17RR		PZ-18R		PZ-18R		SD-17	
				Field Sample ID		OC-SW-ISCO1		OC-SW-ISCO2		OC-SW-ISCO3		OC-SW-PZ16RR		OC-SW-PZ17RR		OC-SW-18R		OC-SW-18R-DUP		OC-SW-SD17	
				Field Sample Date		11/12/09		11/12/09		11/12/09		11/12/09		11/12/09		11/12/09		11/12/09		11/12/09	
				QC Code		FS		FS		FS		FS		FS		FS		FD		FS	
				Lab Sample Delivery Group		360-25577-1		360-25577-1		360-25577-1		360-25577-1		360-25577-1		360-25577-1		360-25577-1		360-25577-1	
Frac	Method	Analyte	Units	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
F	SW6010	Aluminum	ug/l	73	J	110		100	U	93	J	70	J	75	J	84	J	70	J		
F	SW6010	Chromium	ug/l	12		29		5	U	60		68		12		13		59			
F	SW6010	Sodium	ug/l	81000	J	150000	J	79000	J	170000	J	150000	J	82000	J	83000	J	140000			
N	E300	Chloride	mg/l	120		170		160		250		240		110		110		230			
N	E300	Nitrate as N	mg/l	0.05	U	1.4		0.97		3.9		4		0.05	U	0.05	U	4.3			
N	E300	Nitrite as N	mg/l	0.01	U	0.01	U	0.01	U	0.1	U	0.1	U	0.01	U	0.01	U	0.1	U		
N	E300	Sulfate	mg/l	150		510		31		380		250		140		150		200			
N	LACH_107_06_1_B	Nitrogen, as Ammonia	mg/l	33	J	83	J	1.5	J	57	J	37	J	36	J	33	J	28	J		
N	SM2510B	LAB SPECIFIC CONDUCTANCE	umhos/cm	790		1600		650		1600		1300		800		800		1300			
T	SW6010	Aluminum	ug/l	280		350		55	J	4800		3400		290		280		2700			
T	SW6010	Chromium	ug/l	34		68		5	U	1000		770		36		34		620			
T	SW6010	Sodium	ug/l	71000	J	120000	J	60000	J	150000	J	130000	J	74000	J	71000	J	130000			

Notes:

N = normal

T = total (unfiltered)

F = filtered

FS = field sample

FD = field duplicate

U = not detected, value is the detection limit

J = value is estimated

ug/l = microgram per liter

mg/l = milligram per liter

umhos/cm = micro reciprocal ohms per centimeter

Prepared by / Date: KJC 03/23/10

Checked by / Date: CSR 3/23/10

Table 2
Final Results Summary - 360-25552-1, 360-25577-1, & 360-25553-1
November 2009 Slurry Wall / Cap Groundwater, Surface Water and Sediment
Olin Chemical Superfund Site
Wilmington, Massachusetts

				SD-SD1		SD-SD1		SD-SD2		SD-SD3		SD-SD4		SD-SD5	
Loc Name				SD-SD1		SD-SD1		SD-SD2		SD-SD3		SD-SD4		SD-SD5	
Field Sample ID				OC-SD-SD-SD1-0.0/0.5		OC-SD-SD-SD1-0.0/0.5 DU		OC-SD-SD-SD2-0.0/0.5		OC-SD-SD-SD3-0.0/0.5		OC-SD-SD-SD4-0.0/0.5		OC-SD-SD-SD5-0.0/0.5	
Field Sample Date				11/11/09		11/11/09		11/11/09		11/11/09		11/11/09		11/11/09	
QC Code				FS		FD		FS		FS		FS		FS	
Lab Sample Delivery Group				360-25553-1		360-25553-1		360-25553-1		360-25553-1		360-25553-1		360-25553-1	
Frac	Method	Analyte	Units	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
T	SW6010	Aluminum	mg/kg	9200		11000		11000		9900		12000		13000	
T	SW6010	Chromium	mg/kg	21		22		77		20		25		320	
T	SW6010	Iron	mg/kg	11000		18000		17000		14000		15000		18000	
N	E160.3	Percent Moisture	percent	44		42		35		36		41		33	
N	E160.3	Percent Solids	percent	56		58		65		64		59		67	

Notes:

N = normal

T = total (unfiltered)

FS = field sample

FD = field duplicate

mg/kg = milligram per kilogram

Prepared by / Date: KJC 03/23/10

Checked by / Date: CSR 3/23/10

Table 3
Validation Qualification Action Summary
Data Validation Report
November 2009 Slurry Wall / Cap Groundwater, Surface Water and Sediment
Olin Chemical Superfund Site
Wilmington, Massachusetts

SDG	Lab Sample ID	Analytical Method	Field Sample ID	Parameter	Lab Result	Lab Qualifier	Final Result	Final Qualifier	Val Reason Code	Units
360-25577-1	360-25577-1	LACH_107_06_1_B	OC-SW-ISCO3	Nitrogen, as Ammonia	1.5		1.5	J	MS-L	mg/l
360-25577-1	360-25577-1	SW6010	OC-SW-ISCO3	Sodium	79000		79000	J	TD	ug/l
360-25577-1	360-25577-1	SW6010	OC-SW-ISCO3	Sodium	60000		60000	J	TD	ug/l
360-25577-1	360-25577-2	LACH_107_06_1_B	OC-SW-ISCO2	Nitrogen, as Ammonia	83		83	J	MS-L	mg/l
360-25577-1	360-25577-2	SW6010	OC-SW-ISCO2	Sodium	150000		150000	J	TD	ug/l
360-25577-1	360-25577-2	SW6010	OC-SW-ISCO2	Sodium	120000		120000	J	TD	ug/l
360-25577-1	360-25577-3	LACH_107_06_1_B	OC-SW-PZ16RR	Nitrogen, as Ammonia	57		57	J	MS-L	mg/l
360-25577-1	360-25577-3	SW6010	OC-SW-PZ16RR	Sodium	150000		150000	J	TD	ug/l
360-25577-1	360-25577-3	SW6010	OC-SW-PZ16RR	Sodium	170000		170000	J	TD	ug/l
360-25577-1	360-25577-4	LACH_107_06_1_B	OC-SW-PZ17RR	Nitrogen, as Ammonia	37		37	J	MS-L	mg/l
360-25577-1	360-25577-4	SW6010	OC-SW-PZ17RR	Sodium	150000		150000	J	TD	mg/l
360-25577-1	360-25577-4	SW6010	OC-SW-PZ17RR	Sodium	130000		130000	J	TD	mg/l
360-25577-1	360-25577-5	LACH_107_06_1_B	OC-SW-SD17	Nitrogen, as Ammonia	28		28	J	MS-L	mg/l
360-25577-1	360-25577-6	LACH_107_06_1_B	OC-SW-18R	Nitrogen, as Ammonia	36		36	J	MS-L	mg/l
360-25577-1	360-25577-6	SW6010	OC-SW-18R	Sodium	74000		74000	J	TD	ug/l
360-25577-1	360-25577-6	SW6010	OC-SW-18R	Sodium	82000		82000	J	TD	ug/l
360-25577-1	360-25577-7	LACH_107_06_1_B	OC-SW-18R-DUP	Nitrogen, as Ammonia	33		33	J	MS-L	mg/l
360-25577-1	360-25577-7	SW6010	OC-SW-18R-DUP	Sodium	83000		83000	J	TD	ug/l
360-25577-1	360-25577-7	SW6010	OC-SW-18R-DUP	Sodium	71000		71000	J	TD	ug/l
360-25577-1	360-25577-8	LACH_107_06_1_B	OC-SW-ISCO1	Nitrogen, as Ammonia	33		33	J	MS-L	mg/l
360-25577-1	360-25577-8	SW6010	OC-SW-ISCO1	Sodium	81000		81000	J	TD	ug/l
360-25577-1	360-25577-8	SW6010	OC-SW-ISCO1	Sodium	71000		71000	J	TD	ug/l

J - Value is estimated

MS-L - MS and/or MSD recovery low

TD - Dissolved concentration exceeds total

mg/L - milligram per liter

ug/L - microgram per liter

Prepared by / Date: KJC 03/23/10

Checked by / Date: CSR 03/23/10

OLIN-WILMINGTON
LEVEL I DATA QUALITY EVALUATION
STANDARD OPERATING PROCEDURE AND CHECKLIST
ICP METALS BY METHOD 6010B/200.7

Al, Cr

Reviewer/Date Chm Ricard 3/17/10
Sr. Review/Date _____
Lab Report # 25552
Project # 6107700016

1.0 Laboratory Deliverable Requirements

1.1 Laboratory Information: Was all of the following provided in the laboratory report? Yes ☒ No ☐ N/A ☐ Comments:
Check items received.

☒ Name of Laboratory ☒ Address ☒ Project ID ☒ Phone # ☒ Sample identification – Field and Laboratory
Client Information: ☒ Name ☒ Address ☒ Client Contact (IDs must be cross-referenced)

ACTION: If no, contact lab for submission of missing or illegible information.

1.2 Laboratory Report Certification Statement

Yes ☒ No ☐ N/A ☐ Comments:

Does the laboratory report include a completed Analytical Report Certification in the required format?

ACTION: If no, contact lab for submission of missing certification or certification with correct format.

1.3 Laboratory Case Narrative:

Yes ☒ No ☐ N/A ☐ Comments:

☐ Narrative serves as an exception report for the project and method QA/QC performance. ☒ Narrative includes an explanation of each discrepancy on the

Certification Statement.

ACTION: If no, contact lab for submission of missing or illegible information.

1.4 Chain of Custody (COC) copy present with all documentation completed

Yes ☒ No ☐ N/A ☐ Comments:

NOTE: Olin receives and maintains the *original* COC.

ACTION: If no, contact lab for submission of copy of completed COC.

OLIN CORPORATION
LEVEL I DATA QUALITY EVALUATION – OPTION 1
STANDARD OPERATING PROCEDURE AND CHECKLIST
ICP METALS BY METHOD 6010B/200.7

1.5 Sample Receipt Information (*Cooler Receipt Form present?*):

Yes ☒ No ☐ N/A ☐ Comments:

Were each of the following tasks completed and recorded upon receipt of the sample(s) into the laboratory?

- ☒ Sample temperature confirmed: must be 1° – 10° C. (If samples were sent by courier and delivered on the same day as collection, temperature requirement does not apply).
☒ Container type noted ☒ sample condition observed ☒ pH verified (where applicable) ☒ Field and lab IDs cross referenced

ACTION: If no, contact lab for submission of missing or incomplete documentation.

1.5.1 Were all samples delivered to the laboratory without breakage?

Yes ☒ No ☐ N/A ☐ Comments:

1.5.2 Does the *Cooler Receipt Form* or Lab Narrative indicate other problems with sample receipt, condition of the samples, analytical problems or special circumstances affecting the quality of the data?

Yes ☐ No ☒ N/A ☐ Comments:

1.6 Sample Results Section: Was each of the following requirements supplied in the laboratory report for each sample?

Yes ☒ No ☐ N/A ☐ Comments:

☒ Field ID and Lab ID
☒ Clean-up method
☒ Matrix

☒ Date and time collected
☒ Analysis method
☒ Target analytes and concentrations

☒ Analyst Initials
☒ Preparation method

☒ Dilution Factor
☒ Date of preparation/extraction/digestion
☒ Units (soils must be reported in dry weight)

☒ % moisture or solids

☒ Reporting limits

ACTION: If no, contact lab for submission of missing or incomplete information.

1.7 QA/QC Information: Was each of the following information supplied in the laboratory report for each sample batch?

Yes ☒ No ☐ N/A ☐ Comments:

OLIN CORPORATION
LEVEL I DATA QUALITY EVALUATION – OPTION 1
STANDARD OPERATING PROCEDURE AND CHECKLIST
ICP METALS BY METHOD 6010B/200.7

☒ Method blank results ☒ LCS recoveries ☒ MS/MSD recoveries and RPDs ☐ Laboratory duplicate results (where applicable)

ACTION: If no, contact lab for submission of missing or incomplete information.

See MSD, LCSD

2.0 Holding Times

Have any technical holding times, determined from date of collection to date of analysis, been exceeded? Holding time for metals is 180 days from sample collection to analysis for both water and soil. Yes ☐ No ☒ N/A ☐ Comments:

NOTE: List samples that exceed hold time with # of days exceeded on checklist

ACTION: If technical holding times are exceeded, qualify all positive results (J) and non-detects (UJ). If grossly exceeded (2X holding time) reject (R) all non-detect results.

3.0 Laboratory Method

3.1 Was the correct laboratory method used? Yes ☒ No ☐ N/A ☐ Comments:

Water Digestion	3005A or 3010A or 3020A
Soil Digestion	3050B
Metals	6010B or 200.7

ACTION: If no, contact laboratory to provide justification for method change compared to the requested method. Contact senior chemist to inform Client of change and to request variance.

3.2 Are the practical quantitation limits the same as those specified by the Yes ☒ No ☐ N/A ☐ Comments:
☐ SOW ☒ QAPP ☐ Lab ☐ MADEP

NOTE: Verify that the reported metals match the target list specified on the COC.

OLIN CORPORATION
LEVEL I DATA QUALITY EVALUATION – OPTION 1
STANDARD OPERATING PROCEDURE AND CHECKLIST
ICP METALS BY METHOD 6010B/200.7

ACTION: If no, evaluate variation with respect to sample matrix, preparation, dilution, moisture, etc. If sample PQL is indeterminate, contact lab for explanation.

3.3 Are results present for each sample in the SDG?

Yes ☒ No ☐ N/A ☐ Comments:

ACTION: If no, check Request for Analysis to verify if method was ordered and COC to verify that it was sent, and contact lab for resubmission of the missing data

3.4 If dilutions were required, were dilution factors reported?

Yes ☒ No ☐ N/A ☐ Comments:

ACTION: If no, contact the lab for submission.

4.0 **Method Blanks**

4.1 Is the Method Blank Summary present?

Yes ☒ No ☐ N/A ☐ Comments:

ACTION: If no, call the laboratory for submission of missing data.

4.2 Frequency of Analysis: Was a method blank analyzed for each digestion batch of < 20 field samples?

Yes ☒ No ☐ N/A ☐ Comments:

ACTION: If no, contact laboratory for justification. Consult senior chemist for action needed. Narrate non-compliance.

4.3 Is the method blank less than the PQLs for all target elements?

Yes ☒ No ☐ N/A ☐ Comments:

NOTE: MADEP requires the method blank to be matrix matched and digested with the samples

4.4 Do any method blanks have positive results for metals? Qualify data according to the following:

Yes ☐ No ☒ N/A ☐ Comments:

OLIN CORPORATION
LEVEL I DATA QUALITY EVALUATION – OPTION 1
STANDARD OPERATING PROCEDURE AND CHECKLIST
ICP METALS BY METHOD 6010B/200.7

If the sample concentration is $< 5 \times$ blank value, flag sample result non-detect "U" at the PQL or the concentration reported if greater than the PQL.

If the sample concentration is $> 5 \times$ blank value, no qualification is needed.

ACTION: For any blank with positive results, list all contaminants for each method blank including the concentration detected and the flagging level (flagging level = $5 \times$ the blank value) and the associated samples and qualifiers.

5.0 Laboratory Control Standard

5.1 Was a laboratory control standard run with each analytical batch of 20 samples or less? Yes ☒ No ☐ N/A ☐ Comments:

NOTE: A full target, second source LCS is required by MADEP.

ACTION: Call laboratory for LCS form submittal. If data are not available, use professional judgement to evaluate data accuracy associated with that batch.

5.2 Is a LCS Summary Form present? Yes ☒ No ☐ N/A ☐ Comments:

ACTION: If no, contact lab for resubmission of missing data.

5.3 Is the recovery of any analyte outside of MADEP control limits? Yes ☐ No ☒ N/A ☐ Comments:

Sample Type	MADEP % Rec
Water	80-120
Soil	within Lab generated limits

ACTION: If recovery is above the upper limit, qualify all positive sample results within the batch as (J). If recovery is below the lower limit, qualify all positive and non-detects results within the batch as (J). If LCS recovery is $< 30\%$, positive and non-detect results are rejected (R).

Comments:

OLIN CORPORATION
LEVEL I DATA QUALITY EVALUATION – OPTION 1
STANDARD OPERATING PROCEDURE AND CHECKLIST
ICP METALS BY METHOD 6010B/200.7

6.0 Matrix Spikes

Matrix spikes may be collected at different frequencies based on monthly, quarterly, or task specific schedules. Confirm spike requirements for each set with the senior chemist.

6.1 Were project-specific MS/MSDs collected? List project samples that were spiked. Yes ☒ No ☐ N/A ☐ Comments:

ACTION: If no, contact senior chemist to see if any were specified.

6.2 Is the Matrix Spike/Matrix Spike Duplicate Recovery Form present? Yes ☒ No ☐ N/A ☐ Comments:

NOTE: A *full* target, second source MS/MSD is required by MADEP.

ACTION: If any matrix spike data are missing, call lab for resubmission.

6.3 Were matrix spikes analyzed as indicated on the COC and project schedule? Yes ☒ No ☐ N/A ☐ Comments:

ACTION: If any matrix spike data are missing, call lab for resubmission. If none, no qualification is needed. Narrate non-compliance.

6.4 Are any metal spike recoveries outside of the QC limits? Yes ☐ No ☒ N/A ☐ Comments:

Sample Type	<i>MADEP</i> % <i>Rec</i>	QAPP % Rec	Method
Water	75-125	N/A	6010B
Water	N/A	70-130	200.7
Soil	75-125	75-125	6010B

NOTE: %R = $\frac{(SSR-SR)}{SA} \times 100\%$

Where: SSR = Spiked sample result
SR = Sample result
SA = Spike added

NOTE: If dilutions are required due to high sample concentrations (> 4X spike), the data are evaluated, but no flags are applied.

OLIN CORPORATION
LEVEL I DATA QUALITY EVALUATION – OPTION 1
STANDARD OPERATING PROCEDURE AND CHECKLIST
ICP METALS BY METHOD 6010B/200.7

NOTE: If only one of the recoveries for an MS/MSD pair is outside of the control limits, no qualification is necessary. Use professional judgment for the MS/MSD flags.

ACTION: MS/MSD flags only apply to the sample spiked. If the recoveries of the MS and MSD exceed the upper control limit, qualify positive results as estimated (J). If the recoveries of the MS and MSD are lower than the lower control limit, qualify positive results and non-detects (J).

6.5 Are any RPDs for MS/MSD recoveries outside of the QC limits?

Yes ☐ No ☒ N/A ☐ Comments:

NOTE: $RPD = \frac{S-D}{(S+D)/2} \times 100\%$

Where: S = MS sample result
D = MSD sample result

NOTE: If dilutions are required due to high sample concentrations, the data are evaluated, but no flags are applied.

ACTION: If the RPD exceeds the control limit, qualify positive results and non-detects (J).

7.0 **Laboratory Duplicate**

7.1 Was a laboratory duplicate sample analyzed? If so, is the Laboratory Duplicate Sample Form present? Yes ☐ No ☐ N/A ☒ Comments:

NOTE: MADEP refers to this sample as a "matrix duplicate".

ACTION: If not analyzed, qualification is not needed. If data is missing, contact laboratory for resubmission of report. Narrate non-compliance.

7.2 Is the RPD between the result for the laboratory duplicate sample and the result for the parent sample outside of the QA/QC limits?

Yes ☐ No ☐ N/A ☒ Comments:

OLIN CORPORATION
LEVEL I DATA QUALITY EVALUATION – OPTION 1
STANDARD OPERATING PROCEDURE AND CHECKLIST
ICP METALS BY METHOD 6010B/200.7

MADEP Laboratory Duplicate Sample RPD Criteria:

QAPP RPD

For aqueous results $> 5 \times RL$, RPD must be $\pm 20\%$
For aqueous results $< 5 \times RL$, RPD must be $\leq RL$
For soil/sediment results $> 5 \times RL$, RPD must be $\pm 35\%$
For soil/sediment results $< 5 \times RL$, RPD must be $\leq 2 \times RL$

20
20
20
20

ACTION: If the RPD exceeds the limits, qualify both positive results and non-detects as estimated and flag them J. Narrate non-compliance

8.0 Sampling Accuracy

The majority of ground water samples are collected directly from a tap, process stream, or with dedicated tubing. Rinse blanks will not be collected.

8.1 Were rinsate blanks collected? Prior to evaluating rinsate blanks, obtain a list of the associated samples from the senior chemist.

Yes ☐ No ☐ N/A ☒ Comments:

8.2 Do any rinsate blanks have positive results?

Yes ☐ No ☐ N/A ☒ Comments:

NOTE: MADEP does not require the collection of rinsate blanks.

ACTION: Evaluate rinsate results against blank results to determine if contaminant may be laboratory-derived. If results are not lab-related, qualify according to below.

If the sample concentration is $< 5 \times$ blank value, flag sample result non-detect "U" at the PQL or the concentration reported if greater than the PQL.

If the sample concentration is $> 5 \times$ blank value, no qualification is needed.

9.0 Field Duplicates

9.1 Were field duplicate samples collected? Obtain a list of samples and their associated field duplicates.

Yes ☒ No ☐ N/A ☐ Comments:

OLIN CORPORATION
LEVEL I DATA QUALITY EVALUATION – OPTION 1
STANDARD OPERATING PROCEDURE AND CHECKLIST
ICP METALS BY METHOD 6010B/200.7

9.2 Were field duplicates collected per the required frequency?

Yes ☒

No ☐

N/A ☐

Comments:

SOW ☐ QAPP (1 per 10) ☒ MADEP Option 1 (1 per 20) ☐ MADEP Option 3 (1 per 10) ☐

9.3 Was the RPD \leq 50% for soils or waters? Calculate the RPD for all results and attach to this review.

Yes ☒

No ☐

N/A ☐

Comments:

ACTION: RPD must be \leq 50% for soil and water. Qualify data (J) for both sample results if the RPD exceeds 50%.

10.0 Special QA/QC

10.1 Were both total and dissolved metals analysis performed? If so, the dissolved metal concentration should not exceed that of the total metal.

Yes ☐

No ☒

N/A ☒

Comments:

ACTION: If results for both total and dissolved are \geq 5x the PQL **and** the dissolved concentration is 10% higher than the total, flag both results as estimated (J). If total and dissolved concentrations are less than 5x the PQL **and** the **difference** exceeds 2x the PQL, flag both results as estimated (J)

OLIN CORPORATION
LEVEL I DATA QUALITY EVALUATION – OPTION 1
STANDARD OPERATING PROCEDURE AND CHECKLIST
ICP METALS BY METHOD 6010B/200.7

10.0 Application of Validation Qualifiers

Was any of the data qualified?

Yes ☐

No ☒

N/A ☐

Comments:

If so, apply data qualifiers directly to the DQE copy of laboratory report and **flag pages** for entry in database.

REFERENCES

- LAW, 1999, "Final Quality Assurance Project Plan, Olin Wilmington Property, 51 Eames Street, Wilmington, MA", LAW Engineering and Environmental Services, Kennesaw, GA 30144. August 1999
- U.S. Environmental Protection Agency (USEPA), 1989. "Region 1 Laboratory Data Validation Functional Guidelines For Evaluating Inorganic Analyses"; Hazardous Site Evaluation Division; February 1989.
- MADEP, 2001. Massachusetts Department of Environmental Protection Bureau of Waste Site Cleanup, "Massachusetts Quality Assurance and Quality Control (QA/QC) Requirements." BWSC-CAM, Interim Final Draft, Revision No. 2, 5 October 2001.
- MADEP, 2001. Massachusetts Department of Environmental Protection Bureau of Waste Site Cleanup, "Quality Assurance and Quality Control Guidelines for Sampling, Data Evaluation and Reporting Activities," BWSC-CAM, Section VII, Public Comment Draft, Revision No. 0, 21 December 2001.

analysis_method	lab_sample_id	field_sample_id	param_name	final_result		lab_result_text	Dup		result_uom
SW6010	360-25552-10	OC-GW-202S	Aluminum	100	U	100	U	100	ug/l
E300	360-25552-10	OC-GW-202S	Chloride	45		45		51	mg/l
SW6010	360-25552-10	OC-GW-202S	Chromium	4.8	J	4.8	J	4.2	ug/l
SM2510B	360-25552-10	OC-GW-202S	LAB SPECIFIC CONDUCTAN	1200		1200		1200	umhos/cm
LACH_107_06_1_B	360-25552-10	OC-GW-202S	Nitrogen, as Ammonia	69		69		67	mg/l
E300	360-25552-10	OC-GW-202S	Sulfate	380		380		390	mg/l
SW6010	360-25552-20	OC-GW-202S DUP	Aluminum	100	U	100	U		ug/l
E300	360-25552-20	OC-GW-202S DUP	Chloride	51		51			mg/l
SW6010	360-25552-20	OC-GW-202S DUP	Chromium	4.2	J	4.2	J		ug/l
SM2510B	360-25552-20	OC-GW-202S DUP	LAB SPECIFIC CONDUCTAN	1200		1200			umhos/cm
LACH_107_06_1_B	360-25552-20	OC-GW-202S DUP	Nitrogen, as Ammonia	67		67			mg/l
E300	360-25552-20	OC-GW-202S DUP	Sulfate	390		390			mg/l
SW6010	360-25552-15	OC-GW-34D	Aluminum	100	U	100	U	100	ug/l
E300	360-25552-15	OC-GW-34D	Chloride	15		15		15	mg/l
SW6010	360-25552-15	OC-GW-34D	Chromium	14		14		14	ug/l
SM2510B	360-25552-15	OC-GW-34D	LAB SPECIFIC CONDUCTAN	210		210		210	umhos/cm
LACH_107_06_1_B	360-25552-15	OC-GW-34D	Nitrogen, as Ammonia	16		16		15	mg/l
E300	360-25552-15	OC-GW-34D	Sulfate	29		29		29	mg/l
SW6010	360-25552-19	OC-GW-34D DUP	Aluminum	100	U	100	U		ug/l
E300	360-25552-19	OC-GW-34D DUP	Chloride	15		15			mg/l
SW6010	360-25552-19	OC-GW-34D DUP	Chromium	14		14			ug/l
SM2510B	360-25552-19	OC-GW-34D DUP	LAB SPECIFIC CONDUCTAN	210		210			umhos/cm
LACH_107_06_1_B	360-25552-19	OC-GW-34D DUP	Nitrogen, as Ammonia	15		15			mg/l
E300	360-25552-19	OC-GW-34D DUP	Sulfate	29		29			mg/l

Dups All OK

OLIN-WILMINGTON
LEVEL I DATA QUALITY EVALUATION
STANDARD OPERATING PROCEDURE AND CHECKLIST
WET CHEMISTRY PARAMETERS BY VARIOUS METHODS

Anions, NH3, Conductivity

Reviewer/Date Chris Ricard 3/17/10
 Sr. Review/Date _____
 Lab Report # 25552
 Project # 6107100016

Note: The following analyses will be evaluated according to the "MADEP QA/QC Guidelines for Sampling, Data Evaluation and Reporting Activities." MADEP, however, may not list QA/QC criteria for every chemical analysis. Where not defined by MADEP, criteria will default to values stipulated in the QAPP. Where the QAPP does not define criteria, QA/QC requirements will default to limits employed by the laboratory.

NO Qual

1.0 Laboratory Deliverable Requirements

1.1 Laboratory Information: Was all of the following provided in the laboratory report? Yes ☒ No ☐ N/A ☐ Comments: _____
 Check items received.

☒ Name of Laboratory ☒ Address ☒ Project ID ☒ Phone # ☒ Sample identification – Field and Laboratory
 Client Information: ☒ Name ☒ Address ☒ Client Contact (IDs must be cross-referenced)

ACTION: If no, contact lab for submission of missing or illegible information.

1.2 Laboratory Report Certification Statement

Yes ☒ No ☐ N/A ☐ Comments: _____

Does the laboratory report include a completed Analytical Report Certification in the required format?

ACTION: If no, contact lab for submission of missing certification or certification with correct format.

1.3 Laboratory Case Narrative:

Yes ☒ No ☐ N/A ☐ Comments: _____

☐ Narrative serves as an exception report for the project and method QA/QC performance. ☒ Narrative includes an explanation of each discrepancy on the Certification Statement.

ACTION: If no, contact lab for submission of missing or illegible information.

** Sample Dilution for Anions 300.0*

1.4 Chain of Custody (COC) copy present with all documentation completed?

Yes ☒ No ☐ N/A ☐ Comments: _____

Does the laboratory report include copies of Chain of Custody forms containing all samples in this SDG?

NOTE: Olin receives and maintains the *original* COC.

ACTION: If no, contact lab for submission of copy of missing completed COC.

1.5 Sample Receipt Information (Cooler Receipt Form): Were each of the following tasks completed and recorded upon receipt of the sample(s) into the laboratory?

**OLIN-WILMINGTON
LEVEL I DATA QUALITY EVALUATION
STANDARD OPERATING PROCEDURE AND CHECKLIST
WET CHEMISTRY PARAMETERS BY VARIOUS METHODS**

Yes ☒ No ☐ N/A ☐ Comments:

- ☒ Sample temperature confirmed: must be 1° – 10° C. (If samples were sent by courier and delivered on the same day as collection, temperature requirement does not apply).
- ☒ Container type noted ☒ Condition observed ☒ pH verified (where applicable) ☒ Field and lab IDs cross referenced

ACTION: If no, contact lab for submission of missing or incomplete documentation.

1.5.1 Were the correct bottles and preservatives used? ☒

Yes ☒ No ☐ N/A ☐ Comments:

Ammonia, – 1 Liter polyethylene/H₂SO₄ to pH<2, cool to 4°C ☒

Oil & Grease – 1 Liter glass/HCL or H₂SO₄ to pH<2, cool to 4°C

Alkalinity – 1 Liter polyethylene/cool to 4°C

Chemical Oxygen Demand – 50 mL polyethylene/H₂SO₄ to pH<2, cool to 4°C

Chloride, pH, sulfate, nitrate, nitrite - 50 mL polyethylene/cool to 4°C ☒

Nitrate/nitrite - H₂SO₄ to pH<2, cool to 4°C

Organic Carbon – 500 mL amber glass bottle/HCl or H₂SO₄ to pH<2, cool to 4°C

Sulfide – 50 mL polyethylene/ZnAcetate + NaOH to pH>9, cool to 4°C

Phenolics - H₂SO₄ to pH<2, cool to 4°C

Specific conductance, TDS, TSS – 100 mL polyethylene/cool to 4°C ☒

ACTION: If no, inform senior chemist. Document justification for change in container/volume (if applicable), qualify positive and non-detect data (J) data if cooler temperature exceeds 10°C. Rejection of data requires professional judgment

1.5.2 Were all samples delivered to the laboratory without breakage?

Yes ☒ No ☐ N/A ☐ Comments:

1.5.3 Does the *Cooler Receipt Form* or Lab Narrative indicate other problems with sample receipt, condition of the samples, analytical problems or special circumstances affecting the quality of the data?

Yes ☐ No ☒ N/A ☐ Comments:

OLIN-WILMINGTON
LEVEL I DATA QUALITY EVALUATION
STANDARD OPERATING PROCEDURE AND CHECKLIST
WET CHEMISTRY PARAMETERS BY VARIOUS METHODS

1.6 Sample Results Section: Was the following information supplied in the laboratory report for each sample?

Yes ☒ No ☐ N/A ☐ Comments:

- ☒ Field ID and Lab ID ☒ Date and time collected ☒ Analyst Initials ☒ Dilution Factor ☒ % moisture or solids ☒ Reporting limits
☒ Clean-up method ☒ Analysis method ☒ Preparation method ☒ Date of preparation/extraction/digestion clean-up and analysis, where applicable
☒ Matrix ☒ Target analytes and concentrations ☒ Units (soils must be reported in dry weight)

ACTION: If no, contact lab for submission of missing or incomplete information.

1.7 QA/QC Information: Was the following information provided in the laboratory report for each sample batch? Yes ☐ No ☐ N/A ☐ Comments:

- ☒ Method blank results ☒ LCS recoveries ☒ MS/MSD recoveries and RPDs ☒ Laboratory duplicate results (where applicable)

ACTION: If no, contact lab for submission of missing or incomplete information.

2.0 Holding Times

Yes ☐ No ☒ N/A ☐ Comments:

Have any technical holding times, determined from date of collection to date of analysis, been exceeded? The holding times are as follows:

28 days = ammonia, chemical oxygen demand, chloride, organic carbon, oil & grease, specific conductance, total organic carbon and sulfate

Alkalinity = 14 days

Sulfide, TDS, TSS = 7 days

pH = analyze immediately

Nitrate nitrogen as N = 48 hrs

Nitrite nitrogen as N = 48 hrs

Nitrate + Nitrite as N = 28 days

NOTE: List samples that exceed hold time with # of days exceeded on checklist

ACTION: If technical holding times are exceeded qualify results (J). For water samples that are grossly exceeded (>2X hold time) reject (R) all non-detect results. Professional judgment used to qualify soils.

3.0 Laboratory Method

Yes ☒ No ☐ N/A ☐ Comments:

3.1 Was the correct laboratory method used?

ACTION: If no, contact lab to provide justification for method change compared to the requested method. Contact senior chemist to inform Client of change or to request variance.

**OLIN-WILMINGTON
LEVEL I DATA QUALITY EVALUATION
STANDARD OPERATING PROCEDURE AND CHECKLIST
WET CHEMISTRY PARAMETERS BY VARIOUS METHODS**

3.2 Are the practical quantitation limits the same as those specified by the
☒ QAPP/IRSWP ☐ Lab?

Yes ☒ No ☐ N/A ☐ Comments:

Note: The MADEP QA/QC Guidelines do not yet list PQLs for wet chemistry analyses, therefore all criteria will default to values stipulated in the QAPP. Where the QAPP does not define criteria, QA/QC requirements default to limits employed by the lab**. Other criteria may also apply.*

All Detected in samples.

Ammonia* ☐ = 0.1 mg/ L

Alkalinity** ☐ = 1 mg/L

Bicarbonate Alkalinity** ☐ = 1 mg/L

Carbonate Alkalinity** ☐ = 1 mg/L

Nitrate Nitrogen as N* ☐ = .05 mg/L

Nitrite Nitrogen as N* ☐ = .01 mg/L

Chloride* ☐ = 1 mg/L

Hardness * ☐ = 2 mg/L

Spec. Cond. ** ☐ 3 umhos/cm

Total Organic Carbon** ☐ = 1 mg/L

Oil & Grease* ☐ = 5.5 mg/L

Sulfate (EPA 300.0)* ☐ = 2 mg/L

COD:* Low - 20 mg/L

COD* High - 50 mg/L ☐

TDS* ☐ = 10 mg/L

TSS* ☐ = 5 mg/L

pH* ☐ < 2 to > 12

Phenolic - 0.01 mg/L

Other parameter(list) _____ PQL = _____ ☐ Source of PQL = _____

Other parameter(list) _____ PQL = _____ ☐ Source of PQL = _____

ACTION: If no, evaluate change with respect to sample matrix, preparation, dilution, moisture, etc. If sample PQL is indeterminate, contact lab for explanation.

3.3 Are the appropriate parameter results present for each sample in the SDG?

Yes ☒ No ☐ N/A ☐ Comments:

ACTION: If no, check Request for Analysis to verify if method was ordered and COC to verify that it was sent, and contact lab for resubmission of the missing data

3.4 If dilutions were required, were dilution factors reported?

Yes ☒ No ☐ N/A ☐ Comments:

ACTION: If no, contact the lab for submission.

4.0 Method Blanks

Yes ☒ No ☐ N/A ☐ Comments:

4.1 Are the Method Blank Summaries present?

ACTION: If no, call the laboratory for submission of missing data.

4.2 Was a method blank analyzed for each analysis batch of wet chemistry field samples of 20 or less?

Yes ☒ No ☐ N/A ☐ Comments:

OLIN-WILMINGTON
LEVEL I DATA QUALITY EVALUATION
STANDARD OPERATING PROCEDURE AND CHECKLIST
WET CHEMISTRY PARAMETERS BY VARIOUS METHODS

ACTION: If no, document discrepancy in case narrative and contact lab for justification. Consult senior chemist for action needed.

4.3 Is the method blank less than the PQL? (See Section 3.2 for PQLs).

Yes ☒

No ☐

N/A ☐

Comments:

4.4 Do any method blanks have positive results for wet chemistry parameters? Qualify data according to the following:

Yes ☐

No ☒

N/A ☐

Comments:

If the sample concentration is $< 5 \times$ blank value, flag sample result non-detect "U" at the PQL or the concentration reported if greater than the PQL.

If the sample concentration is $> 5 \times$ blank value, no qualification is needed.

ACTION: If any blank has positive results, list all the concentrations detected and flagging level (flagging level = $5 \times$ blank value) on the checklist. List all affected samples and their qualifiers.

5.0 Laboratory Control Standards

5.1 Was a laboratory control standard (LCS) run with each analytical batch of 20 samples or less?

Yes ☒

No ☐

N/A ☐

Comments:

ACTION: If no, call laboratory for LCS form submittal. If data is not available, use professional judgment to determine qualification actions for data associated with the batch.

5.2 Is a LCS Summary Form present?

Yes ☒

No ☐

N/A ☐

Comments:

ACTION: If no, contact lab for resubmission of missing data.

5.3 Is any wet chemistry analyte LCS recovery outside the control limits?

Yes ☐

No ☒

N/A ☐

Comments:

OLIN-WILMINGTON
LEVEL I DATA QUALITY EVALUATION
STANDARD OPERATING PROCEDURE AND CHECKLIST
WET CHEMISTRY PARAMETERS BY VARIOUS METHODS

LCS Limits:

Alkalinity** ☐ = 80-120%

Bicarbonate Alkalinity** ☐ = 80-120%

Carbonate Alkalinity** ☐ = 80-120%

Specific Conductivity *☒ = 80-120%

Total Organic Carbon** ☐ = 80-120%

TDS** ☐ = 80-120%

Oil & Grease* ☐ = 80-120%

Ammonia Nitrogen as N* ☒ = 80-120%

COD Low* ☐ = 80-120%

COD High* ☐ = 80-120%

Nitrate Nitrogen as N** ☐ = 80-120%

Nitrite Nitrogen as N** ☐ = 80-120%

Hardness* ☐ = 80-120%

Chloride* ☒ = 80-120%

Sulfate (EPA 300.0)* ☒ = 80-120%

pH* ☐ = 98-102%

TSS* NA

Other parameter(list) _____ %R = _____ ☐ Rec Limits = _____

Other parameter(list) _____ %R = _____ ☐ Rec Limits = _____

(MADEP has not yet defined LCS recovery limits for wet chemistry analyses.)

ACTION: If recovery is above the upper limit, qualify all positive sample results within the batch as (J). If recovery is below the lower limit, qualify all positive and no-detect results within the batch as (J). If LCS recovery is <10%, non-detect results are rejected (R).

6.0 Matrix Spikes

Matrix spikes may be collected at different frequencies based on monthly, quarterly, or task specific schedules. Confirm spike requirements for each set with the senior chemist.

6.1 Were project-specific MS/MSDs analyzed? List project samples that were spiked.

ACTION: If no, contact senior chemist to see if any were specified.

Yes ☒ No ☐ N/A ☐ Comments:

6.2 Is the MS/MSD Recovery Form present?

ACTION: If no, contact lab for resubmission of missing data.

Yes ☒ No ☐ N/A ☐ Comments:

6.3 Were matrix spikes analyzed at the required frequency of 1 per 20 samples per matrix?

ACTION: If any matrix spike data is missing, call lab for resubmission.

Yes ☒ No ☐ N/A ☐ Comments:

6.4 Are any wet chemistry analyte spike recoveries outside of the QC limits?

Yes ☒ No ☐ N/A ☐ Comments:

NH₃ out high in OG-6W-2025
but sample = 4x spike.
No evaluation.

**OLIN-WILMINGTON
LEVEL I DATA QUALITY EVALUATION
STANDARD OPERATING PROCEDURE AND CHECKLIST
WET CHEMISTRY PARAMETERS BY VARIOUS METHODS**

NOTE: $\%R_{SA} = \frac{(SSR-SR)}{SA} \times 100\%$
SA = Spike added

Where: $SSR = \frac{\text{Spiked sample result}}{\text{SR} = \text{Sample result}}$

MS/MSD Recovery Limits:

$$\text{Alkalinity}^* = \text{NA}$$
$$\text{Bicarbonate Alkalinity}^* = \text{NA}$$

Carbonate alkalinity* = NA

Ammonia* (LACHAT) ☒ = 75-125%

Chloride*(SM 4500 Cl) ☒ = 75-125%

Specific Conductivity * = NA

Total Organic Carbon* = NA

TDS** = NA

Oil & Grease* = NA

COD Low* □ = 75-125%

COD High* □ = 75-125%

Nitrate Nitrogen as N** □ = 75-125%

Nitrite Nitrogen as N** □ = 75-125%

Hardness* □ = 75-125%

Sulfate (EPA 300.0)* ☒ =

6. $\text{pH}^* = \text{NA}$

$$\text{TSS}^* = \text{NA}$$

Other parameter(list) _____ % R = _____ ☐ Rec Limits = _____

* = Laboratory Limits ** = Olin QAPP Limits (MADEP has not yet defined LCS recovery limits for wet chemistry analyses.)

NOTES: 1) If only one of the recoveries for an MS/MSD pair is outside of the control limits, no qualification is necessary. Use professional judgment for the MS/MSD flags.
2) If the MS/MSD was performed by the laboratory on a non-project sample, no qualification is required.

ACTION: MS/MSD flags only apply to the sample spiked. Do not evaluate if sample concentration is $> 4X$ spike. If the recoveries of the MS and MSD exceed the upper control limit, qualify positive results as estimated (J). If the recoveries of the MS and MSD are lower than the lower control limit but $> 30\%$, qualify both positive results and non-detects (J). If the MS/MSD recovery is $< 30\%$ and the sample is non-detect, the results are considered unusable and flagged (R).

ACTION: Laboratory control limits apply when spiked sample results fall within the normal calibration range. If dilutions are required due to high sample concentrations, the data is evaluated, but no flags are applied.

6.5 Are any RPDs for MS/MSD recoveries outside of the QA/QC limits?

NOTE: $RPD = \frac{S - D}{(S + D)/2} \times 100\%$ Where S = MS result
D = MSD result

Yes [☐] No [☒] N/A [☐] Comments:

MS/MSD RPD Limits:

$$\text{RPD} \leq 20$$

7.0 Laboratory Duplicate

Are the RPDs for the laboratory duplicates <20% unless otherwise specified below?

Yes [] No [] N/A [] Comments:

**OLIN-WILMINGTON
LEVEL I DATA QUALITY EVALUATION
STANDARD OPERATING PROCEDURE AND CHECKLIST
WET CHEMISTRY PARAMETERS BY VARIOUS METHODS**

ACTION: If the RPD is greater than specified limits, qualify all results for that analyte as estimated (J).

pH* ☐ = 3%

Specific Conductivity *☒ = 5%

TSS** ☐ = 6%

TDS** ☐ = 6%

8.0 Sampling Accuracy

The majority of ground water samples are collected directly from a tap, process stream, or with dedicated tubing. Rinse blanks will not be collected.

8.1 Were rinsate blanks collected? Prior to evaluating rinsate blanks, obtain a list of the associated samples from the senior chemist.

Yes ☐

No ☒

N/A ☐

Comments:

8.2 Do any rinsate blanks have positive results?

Yes ☐

No ☐

N/A ☒

Comments:

ACTION: Evaluate rinsate results vs. blank results to determine if contaminant may be laboratory-derived. If not lab-related, qualify according to the table below.

If the sample concentration is $< 5 \times$ blank value, flag sample result non-detect "U" at the PQL or the concentration reported if greater than the PQL.

If the sample concentration is $> 5 \times$ blank value, no qualification is needed.

NOTE: MADEP does not require the collection of rinsate blanks.

9.0 Field Duplicates

9.1 Were field duplicate samples collected? Obtain a list of samples and their associated field duplicates.

Yes ☒

No ☐

N/A ☐

Comments:

9.2 Were field duplicates collected per the required frequency?

Yes ☒

No ☐

N/A ☐

Comments:

QAPP/IRSWP ☒ MADEP Option 1 (1 per 20) ☐ MADEP Option 3 (1 per 10) ☐

9.3 Was the RPD $\leq 30\%$ for waters $\leq 50\%$ for soils? Calculate the RPD for results and attach to this review.

Yes ☒

No ☐

N/A ☐

Comments:

OLIN-WILMINGTON
LEVEL I DATA QUALITY EVALUATION
STANDARD OPERATING PROCEDURE AND CHECKLIST
WET CHEMISTRY PARAMETERS BY VARIOUS METHODS

ACTION: Qualify data (J) for both sample results if the RPD exceeded.

Was any of the data qualified?

Yes ☐

No ☒

N/A ☐

Comments:

If so, apply data qualifiers directly to the DQE copy of laboratory report and **flag pages** for entry in database.

REFERENCES:-

MACTEC, 2007. "Draft Interim Response Steps Work Plan"; Olin Chemical Superfund Site, 51 Eames Street, Wilmington, Massachusetts.; Project No. 6300-06-0010/41.1; July 25, 2007.

Massachusetts Department of Environmental Protection (MADEP), 2004. "The Compendium of Quality Assurance and Quality Control Requirements and Performance Standards for Selected Analytical Methods Used in Support of Response Actions for the Massachusetts Contingency Plan (MCP)"; Bureau of Waste Site Cleanup; 1 Winter Street, Boston, Massachusetts 02108; WSC-CAM; May 2004.

ANALYTICAL REPORT

Job Number: 360-25552-1

Job Description: Olin Chemical Groundwater Quarterly

For:

Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441
Attention: Mr. Steven Morrow

CHECKED FOR COMPLETENESS
OF PARAMETERS ORDERED BY:

Ch. Record

Joseph A. Chimi

Approved for release.
Joe Chimi
Report Production Representative
11/25/2009 10:43 AM

Designee for
Becky C Mason
Project Manager II
becky.mason@testamericainc.com
11/25/2009

Results relate only to the items tested and the sample(s) as received by the laboratory. The test results in this report meet all NELAC requirements for accredited parameters, exceptions are noted in this report. Pursuant to NELAC, this report may not be reproduced except in full, and with written approval from the laboratory. TestAmerica Westfield Certifications and Approvals: MADEP MA014, RIDOH57, CTDPH 0494, VT DECWSD, NH DES 2539, NELAP FL E87912 TOX, NELAP NJ MA008 TOX, NELAP NY 10843, NY ELAP 10843, North Carolina 647, NELAP PA 68-04386. Field sampling is performed under SOPs WE-FLD-001 and WE-FLD-002.

TestAmerica Laboratories, Inc.

TestAmerica Westfield Westfield Executive Park, 53 Southampton Road, Westfield, MA 01085

Tel (413) 572-4000 Fax (413) 572-3707 www.testamericainc.com



Table of Contents

Cover Title Page	1
Report Narrative	3
Executive Summary	7
Method Summary	12
Method / Analyst Summary	13
Sample Summary	14
Sample Results	15
Sample Datasheets	16
Data Qualifiers	56
QC Results	57
Qc Association Summary	58
Qc Reports	64
Shipping and Receiving Documents	85
Sample Receipt Checklist	86
Client Chain of Custody	87

MADEP MCP Analytical Method Report Certification Form

Laboratory Name: TestAmerica Westfield	Project #: 360-25552-1																		
Project Location: MADEP RTN¹:																			
This form provides certifications for the following data set:[list Laboratory Sample ID Number(s)] 360-25552-(1-20)																			
Sample Matrices:	Groundwater Soil/Sediment Drinking Water Other:																		
MCP SW-846 Methods Used	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 16.6%;">8260B ()</td> <td style="width: 16.6%;">8151A ()</td> <td style="width: 16.6%;">8330 ()</td> <td style="width: 16.6%;">6010B (x)</td> <td style="width: 16.6%;">7470A/1A ()</td> <td style="width: 16.6%;">Other ()</td> </tr> <tr> <td>8270C ()</td> <td>8081A ()</td> <td>VPH ()</td> <td>6020 ()</td> <td colspan="2">9014M²/9012 ()</td> </tr> <tr> <td>8082 ()</td> <td>8021B ()</td> <td>EPH ()</td> <td>7000 S³()</td> <td>7196A ()</td> <td></td> </tr> </table>	8260B ()	8151A ()	8330 ()	6010B (x)	7470A/1A ()	Other ()	8270C ()	8081A ()	VPH ()	6020 ()	9014M ² /9012 ()		8082 ()	8021B ()	EPH ()	7000 S ³ ()	7196A ()	
	8260B ()	8151A ()	8330 ()	6010B (x)	7470A/1A ()	Other ()													
	8270C ()	8081A ()	VPH ()	6020 ()	9014M ² /9012 ()														
8082 ()	8021B ()	EPH ()	7000 S ³ ()	7196A ()															
As specified in MADEP Compendium of Analytical Methods. (check all that apply)	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td colspan="6"> 1 List Release Tracking Number (RTN), if known 2 M - SW-846 Method 9014 or MADEP Physiologically Available Cyanide (PAC) Method 3 S - SW-846 Methods 7000 Series List individual method and analyte. </td> </tr> </table>	1 List Release Tracking Number (RTN), if known 2 M - SW-846 Method 9014 or MADEP Physiologically Available Cyanide (PAC) Method 3 S - SW-846 Methods 7000 Series List individual method and analyte.																	
1 List Release Tracking Number (RTN), if known 2 M - SW-846 Method 9014 or MADEP Physiologically Available Cyanide (PAC) Method 3 S - SW-846 Methods 7000 Series List individual method and analyte.																			

An affirmative response to questions A, B, C and D is required for "Presumptive Certainty" status

A	Were all samples received by the laboratory in a condition consistent with that described on the Chain-of-Custody documentation for the data set?	Yes √	No ¹
B	Were all QA/QC procedures required for the specified analytical method(s) included in this report followed, including the requirement to note and discuss in a narrative QC data that did not meet appropriate performance standards or guidelines?	Yes √	No ¹
C	Does the analytical data included in this report meet all the requirements for "Presumptive Certainty", as described in Section 2.0 (a), (b), (c) and (d) of the MADEP document CAM VII A, " Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?	Yes √	N/A No ¹
D	VPH and EPH methods only: Was the VPH or EPH Method conducted without significant modifications (see Section 11.3 of respective Methods)?	Yes √	N/A No ¹

A response to questions E and F below is required for "Presumptive Certainty" status

E	Were all QC performance standards and recommendations for the specified methods achieved?	Yes √	No ¹
F	Were results for all analyte-list compounds/elements for the specified method(s) reported?	Yes √	N/A No ¹

¹ All Negative responses must be addressed in an attached Environmental Laboratory case narrative.

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, accurate and complete.

Signature: 

Position: Laboratory Director


Printed Name: Steven C. Hartmann

Date: 11/25/09 10:37

The certification form has been electronically signed and approved.

CAM VII A, Rev 3.2

April-04

 THE LEADER IN ENVIRONMENTAL TESTING	MADEP MA014 NY DOH 10843 RI DOH 57 CT DPH 0494 VT DECWSD	NELAP FL E87912 TOX NELAP NJ MA008 TOX NELAP NY 10843 NH DES 253901-A
		
TestAmerica Westfield 53 Southampton Rd, Westfield, MA 01085 Tel:(413)572-4000 Fax:(413)572-3707		

MADEP MCP Analytical Method Report Certification Form

Laboratory Name: TestAmerica Westfield	Project #: 360-25552-1
Project Location: MADEP RTN¹:	
This form provides certifications for the following data set:[list Laboratory Sample ID Number(s)] 360-25552-(1-20)	
Sample Matrices:	Groundwater Soil/Sediment Drinking Water Other:
MCP SW-846	8260B () 8151A () 8330 () 6010B () 7470A/1A () Other (x)
Methods Used	8270C () 8081A () VPH () 6020 () 9014M ² /9012 ()
As specified in MADEP Compendium of Analytical Methods. (check all that apply)	8082 () 8021B () EPH () 7000 S ³ () 7196A ()
1 List Release Tracking Number (RTN), if known 2 M - SW-846 Method 9014 or MADEP Physiologically Available Cyanide (PAC) Method 3 S - SW-846 Methods 7000 Series List individual method and analyte.	

An affirmative response to questions A, B, C and D is required for "Presumptive Certainty" status

A	Were all samples received by the laboratory in a condition consistent with that described on the Chain-of-Custody documentation for the data set?	Yes √	No ¹
B	Were all QA/QC procedures required for the specified analytical method(s) included in this report followed, including the requirement to note and discuss in a narrative QC data that did not meet appropriate performance standards or guidelines?	Yes √	No ¹
C	Does the analytical data included in this report meet all the requirements for "Presumptive Certainty", as described in Section 2.0 (a), (b), (c) and (d) of the MADEP document CAM VII A, " Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?	Yes N/A √	No ¹
D	VPH and EPH methods only: Was the VPH or EPH Method conducted without significant modifications (see Section 11.3 of respective Methods)?	Yes N/A √	No ¹

A response to questions E and F below is required for "Presumptive Certainty" status

E	Were all QC performance standards and recommendations for the specified methods achieved?	Yes	No ¹ √
F	Were results for all analyte-list compounds/elements for the specified method(s) reported?	Yes N/A √	No ¹

¹ All Negative responses must be addressed in an attached Environmental Laboratory case narrative.

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, accurate and complete.

Signature:



Position: Laboratory Director

Printed Name: Steven C. Hartmann

Date: 11/25/09 10:37

The certification form has been electronically signed and approved.

CAM VII A, Rev 3.2

April-04



MADEP MA014
NY DOH 10843
RI DOH 57
CT DPH 0494
VT DECWSD

NELAP FL E87912 TOX
NELAP NJ MA008 TOX
NELAP NY 10843
NH DES 253901-A



TestAmerica Westfield
53 Southampton Rd,
Westfield, MA 01085
Tel:(413)572-4000
Fax:(413)572-3707

CASE NARRATIVE

Client: Olin Corporation

Project: Olin Chemical Groundwater Quarterly

Report Number: 360-25552-1

This case narrative is in the form of an exception report, where only the anomalies related to this report, method specific performance and/or QA/QC issues are discussed. If there are no issues to report, this narrative will include a statement that documents that there are no relevant data issues.

It should be noted that samples with elevated Reporting Limits (RLs) as a result of a dilution may not be able to satisfy customer reporting limits in some cases. Such increases in the RLs are unavoidable but acceptable consequence of sample dilution that enables quantification of target analytes or interferences which exceed the calibration range of the instrument.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT

The samples were received on 11/11/2009; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 5.6 C.

Note: All samples which require thermal preservation are considered acceptable if the arrival temperature is within 2C of the required temperature or method specified range. For samples with a specified temperature of 4C, samples with a temperature ranging from just above freezing temperature of water to 6C shall be acceptable. Samples that are hand delivered immediately following collection may not meet these criteria, however they will be deemed acceptable according to NELAC standards, if there is evidence that the chilling process has begun, such as arrival on ice, etc.

MCP regulatory standard criteria were not specified for this report. Therefore, method reporting limits (RLs) were not assessed against any MCP standards as it may pertain to Question "E" on the Presumptive Certainty Certification Form (MADEP reference: WSC-CAM-AN-093008 - WSC-CAM Analytical Notes).

DISSOLVED METALS

Samples 360-25552-1 through 360-25552-20 were analyzed for dissolved metals in accordance with EPA SW-846 Method 6010B. The samples were analyzed on 11/13/2009 and 11/16/2009.

At the request of the client, an abbreviated/modified MCP analyte list was reported for this job.

No difficulties were encountered during the dissolved metals analyses.

All quality control parameters were within the acceptance limits.

ANIONS

Samples 360-25552-1 through 360-25552-20 were analyzed for anions in accordance with EPA Method 300.0. The samples were analyzed on 11/16/2009, 11/17/2009, 11/18/2009 and 11/19/2009.

Samples 360-25552-2(10X), 360-25552-2(20X), 360-25552-3(5X), 360-25552-7(5X), 360-25552-8(10X), 360-25552-8(20X), 360-25552-9 through 360-25552-12(10X), 360-25552-13(5X), 360-25552-17(5X), 360-25552-18(10X), 360-25552-18(20X) and 360-25552-20(5X) required dilution prior to analysis due to high target concentration. The reporting limits have been adjusted accordingly.

No difficulties were encountered during the anions analyses.

All quality control parameters were within the acceptance limits.

AMMONIA

Samples 360-25552-1 through 360-25552-20 were analyzed for ammonia in accordance with LACHAT 107-06-1B. The samples were prepared and analyzed on 11/18/2009 and 11/24/2009.

Ammonia failed the recovery criteria high for the MS and MSD of sample 360-25552-10 in batch 360-51839. The presence of the '4' qualifier in the report indicates analytes where the concentration in the unspiked sample exceeded four times the spiking amount. The associated LCS recovered within control limits. Refer to the QC report for details.

Samples 360-25552-2(10X), 360-25552-4(5X), 360-25552-6(5X), 360-25552-7(10X), 360-25552-8(20X), 360-25552-9(10X), 360-25552-10(10X), 360-25552-11(20X), 360-25552-12(10X), 360-25552-13(2X), 360-25552-17(2X), 360-25552-18(20X) and 360-25552-20(10X) required dilution prior to analysis due to high concentration. The reporting limits have been adjusted accordingly.

No other difficulties were encountered during the ammonia analyses.

All other quality control parameters were within the acceptance limits.

SPECIFIC CONDUCTANCE

Samples 360-25552-1 through 360-25552-20 were analyzed for specific conductance in accordance with SM 2510B. The samples were analyzed on 11/12/2009 and 11/13/2009.

No difficulties were encountered during the specific conductance analyses.

All quality control parameters were within the acceptance limits.

EXECUTIVE SUMMARY - Detections

Client: Olin Corporation

Job Number: 360-25552-1

Lab Sample ID Analyte	Client Sample ID	Result / Qualifier	Reporting Limit	Units	Method
360-25552-1	OC-GW-42S				
Sulfate		6.4	2.0	mg/L	300.0
Chloride		44	1.0	mg/L	300.0
Ammonia		0.21	0.10	mg/L	L107-06-1B
Specific Conductance		220	1.0	umhos/cm	SM 2510B
<i>Dissolved</i>					
Aluminum		260	100	ug/L	6010B
Chromium		6.6	5.0	ug/L	6010B
360-25552-2	OC-GW-201S				
Sulfate		1300	40	mg/L	300.0
Chloride		60	10	mg/L	300.0
Ammonia		130	1.0	mg/L	L107-06-1B
Specific Conductance		2800	1.0	umhos/cm	SM 2510B
<i>Dissolved</i>					
Chromium		11	5.0	ug/L	6010B
360-25552-3	OC-GW-10S				
Sulfate		130	10	mg/L	300.0
Chloride		31	5.0	mg/L	300.0
Ammonia		7.8	0.10	mg/L	L107-06-1B
Specific Conductance		390	1.0	umhos/cm	SM 2510B
<i>Dissolved</i>					
Aluminum		4300	100	ug/L	6010B
360-25552-4	OC-GW-26				
Sulfate		68	2.0	mg/L	300.0
Chloride		18	1.0	mg/L	300.0
Ammonia		28	0.50	mg/L	L107-06-1B
Specific Conductance		360	1.0	umhos/cm	SM 2510B
<i>Dissolved</i>					
Chromium		6.9	5.0	ug/L	6010B

EXECUTIVE SUMMARY - Detections

Client: Olin Corporation

Job Number: 360-25552-1

Lab Sample ID Analyte	Client Sample ID	Result / Qualifier		Reporting Limit	Units	Method
360-25552-5	OC-GW-76S					
Sulfate		35		2.0	mg/L	300.0
Chloride		3.1		1.0	mg/L	300.0
Ammonia		8.3		0.10	mg/L	L107-06-1B
Specific Conductance		150		1.0	umhos/cm	SM 2510B
<i>Dissolved</i>						
Chromium		2.0	J	5.0	ug/L	6010B
360-25552-6	OC-GW-24					
Sulfate		62		2.0	mg/L	300.0
Chloride		6.5		1.0	mg/L	300.0
Ammonia		38		0.50	mg/L	L107-06-1B
Specific Conductance		360		1.0	umhos/cm	SM 2510B
360-25552-7	OC-GW-25					
Sulfate		100		10	mg/L	300.0
Chloride		63		5.0	mg/L	300.0
Ammonia		41		1.0	mg/L	L107-06-1B
Specific Conductance		640		1.0	umhos/cm	SM 2510B
<i>Dissolved</i>						
Chromium		1.6	J	5.0	ug/L	6010B
360-25552-8	OC-GW-79S					
Sulfate		1400		40	mg/L	300.0
Chloride		210		10	mg/L	300.0
Ammonia		190		2.0	mg/L	L107-06-1B
Specific Conductance		3400		1.0	umhos/cm	SM 2510B
<i>Dissolved</i>						
Chromium		8.9		5.0	ug/L	6010B
360-25552-9	OC-GW-78S					
Sulfate		540		20	mg/L	300.0
Chloride		22		1.0	mg/L	300.0
Ammonia		61		1.0	mg/L	L107-06-1B
Specific Conductance		1300		1.0	umhos/cm	SM 2510B
<i>Dissolved</i>						
Chromium		2.1	J	5.0	ug/L	6010B

EXECUTIVE SUMMARY - Detections

Client: Olin Corporation

Job Number: 360-25552-1

Lab Sample ID Analyte	Client Sample ID	Result / Qualifier		Reporting Limit	Units	Method
360-25552-10	OC-GW-202S					
Sulfate		380		20	mg/L	300.0
Chloride		45		10	mg/L	300.0
Ammonia		69		1.0	mg/L	L107-06-1B
Specific Conductance		1200		1.0	umhos/cm	SM 2510B
<i>Dissolved</i>						
Chromium		4.8	J	5.0	ug/L	6010B
360-25552-11	OC-PZ-16RR					
Sulfate		970		20	mg/L	300.0
Chloride		190		10	mg/L	300.0
Ammonia		230		2.0	mg/L	L107-06-1B
Specific Conductance		3000		1.0	umhos/cm	SM 2510B
<i>Dissolved</i>						
Chromium		6.5		5.0	ug/L	6010B
360-25552-12	OC-PZ-17RR					
Sulfate		470		20	mg/L	300.0
Chloride		18		1.0	mg/L	300.0
Ammonia		58		1.0	mg/L	L107-06-1B
Specific Conductance		1400		1.0	umhos/cm	SM 2510B
<i>Dissolved</i>						
Chromium		3.0	J	5.0	ug/L	6010B
360-25552-13	OC-PZ-18R					
Sulfate		80		2.0	mg/L	300.0
Chloride		79		5.0	mg/L	300.0
Ammonia		26		0.20	mg/L	L107-06-1B
Specific Conductance		570		1.0	umhos/cm	SM 2510B
<i>Dissolved</i>						
Chromium		13		5.0	ug/L	6010B
360-25552-14	OC-GW-34SR					
Sulfate		8.0		2.0	mg/L	300.0
Chloride		1.2		1.0	mg/L	300.0
Ammonia		0.24		0.10	mg/L	L107-06-1B
Specific Conductance		83		1.0	umhos/cm	SM 2510B

EXECUTIVE SUMMARY - Detections

Client: Olin Corporation

Job Number: 360-25552-1

Lab Sample ID Analyte	Client Sample ID	Result / Qualifier	Reporting Limit	Units	Method
360-25552-15	OC-GW-34D				
Sulfate		29	2.0	mg/L	300.0
Chloride		15	1.0	mg/L	300.0
Ammonia		16	0.10	mg/L	L107-06-1B
Specific Conductance		210	1.0	umhos/cm	SM 2510B
<i>Dissolved</i>					
Chromium		14	5.0	ug/L	6010B
360-25552-16	OC-GW-CA-1				
Sulfate		86	2.0	mg/L	300.0
Chloride		6.0	1.0	mg/L	300.0
Ammonia		1.1	0.10	mg/L	L107-06-1B
Specific Conductance		600	1.0	umhos/cm	SM 2510B
<i>Dissolved</i>					
Chromium		3.3 J	5.0	ug/L	6010B
360-25552-17	OC-GW-35S				
Sulfate		190	10	mg/L	300.0
Chloride		7.0	1.0	mg/L	300.0
Ammonia		23	0.20	mg/L	L107-06-1B
Specific Conductance		710	1.0	umhos/cm	SM 2510B
<i>Dissolved</i>					
Chromium		19	5.0	ug/L	6010B
360-25552-18	OC-GW-202D				
Sulfate		1700	40	mg/L	300.0
Chloride		250	10	mg/L	300.0
Ammonia		260	2.0	mg/L	L107-06-1B
Specific Conductance		4000	1.0	umhos/cm	SM 2510B
<i>Dissolved</i>					
Aluminum		11000	100	ug/L	6010B
Chromium		770	5.0	ug/L	6010B

EXECUTIVE SUMMARY - Detections

Client: Olin Corporation

Job Number: 360-25552-1

Lab Sample ID Analyte	Client Sample ID	Result / Qualifier	Reporting Limit	Units	Method
360-25552-19	OC-GW-34D DUP				
Sulfate		29	2.0	mg/L	300.0
Chloride		15	1.0	mg/L	300.0
Ammonia		15	0.10	mg/L	L107-06-1B
Specific Conductance		210	1.0	umhos/cm	SM 2510B
<i>Dissolved</i>					
Chromium		14	5.0	ug/L	6010B
360-25552-20	OC-GW-202S DUP				
Sulfate		390	10	mg/L	300.0
Chloride		51	5.0	mg/L	300.0
Ammonia		67	1.0	mg/L	L107-06-1B
Specific Conductance		1200	1.0	umhos/cm	SM 2510B
<i>Dissolved</i>					
Chromium		4.2 J	5.0	ug/L	6010B

METHOD SUMMARY

Client: Olin Corporation

Job Number: 360-25552-1

Description	Lab Location	Method	Preparation Method
Matrix: Water			
Dissolved Metals	TAL WFD	SW846 6010B	
Sample Filtration, Field	TAL WFD		FIELD_FLTRD
Chloride & Sulfate	TAL WFD	40CFR136A 300.0	
Nitrogen Ammonia	TAL WFD	LACHAT L107-06-1B	
Distillation, Ammonia	TAL WFD		Distill/Ammonia
Conductivity, Specific Conductance	TAL WFD	SM SM 2510B	

Lab References:

TAL WFD = TestAmerica Westfield

Method References:

40CFR136A = "Methods for Organic Chemical Analysis of Municipal Industrial Wastewater", 40CFR, Part 136, Appendix A, October 26, 1984 and subsequent revisions.

LACHAT = LACHAT

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

METHOD / ANALYST SUMMARY

Client: Olin Corporation

Job Number: 360-25552-1

Method	Analyst	Analyst ID
SW846 6010B	Smith, Tim J	TJS
40CFR136A 300.0	Lalashius, Andrew L	ALL
LACHAT L107-06-1B	Lalashius, Andrew L	ALL
SM SM 2510B	Emerich, Rich W	RWE

SAMPLE SUMMARY

Client: Olin Corporation

Job Number: 360-25552-1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
360-25552-1	OC-GW-42S	Ground Water	11/09/2009 1055	11/11/2009 1715
360-25552-2	OC-GW-201S	Ground Water	11/09/2009 1405	11/11/2009 1715
360-25552-3	OC-GW-10S	Ground Water	11/10/2009 0945	11/11/2009 1715
360-25552-4	OC-GW-26	Ground Water	11/10/2009 0950	11/11/2009 1715
360-25552-5	OC-GW-76S	Ground Water	11/10/2009 1110	11/11/2009 1715
360-25552-6	OC-GW-24	Ground Water	11/10/2009 1050	11/11/2009 1715
360-25552-7	OC-GW-25	Ground Water	11/10/2009 1145	11/11/2009 1715
360-25552-8	OC-GW-79S	Ground Water	11/10/2009 1240	11/11/2009 1715
360-25552-9	OC-GW-78S	Ground Water	11/11/2009 1245	11/11/2009 1715
360-25552-10	OC-GW-202S	Ground Water	11/11/2009 1128	11/11/2009 1715
360-25552-10MS	OC-GW-202S MS	Ground Water	11/11/2009 1128	11/11/2009 1715
360-25552-10MSD	OC-GW-202S MSD	Ground Water	11/11/2009 1128	11/11/2009 1715
360-25552-11	OC-PZ-16RR	Ground Water	11/10/2009 1305	11/11/2009 1715
360-25552-12	OC-PZ-17RR	Ground Water	11/10/2009 1350	11/11/2009 1715
360-25552-13	OC-PZ-18R	Ground Water	11/10/2009 1505	11/11/2009 1715
360-25552-14	OC-GW-34SR	Ground Water	11/11/2009 0907	11/11/2009 1715
360-25552-15	OC-GW-34D	Ground Water	11/11/2009 0905	11/11/2009 1715
360-25552-15MS	OC-GW-34D MS	Ground Water	11/11/2009 1020	11/11/2009 1715
360-25552-15MSD	OC-GW-34D MSD	Ground Water	11/11/2009 1040	11/11/2009 1715
360-25552-16	OC-GW-CA-1	Ground Water	11/11/2009 1150	11/11/2009 1715
360-25552-17	OC-GW-35S	Ground Water	11/11/2009 1040	11/11/2009 1715
360-25552-18	OC-GW-202D	Ground Water	11/11/2009 1150	11/11/2009 1715
360-25552-19	OC-GW-34D DUP	Ground Water	11/11/2009 0905	11/11/2009 1715
360-25552-20	OC-GW-202S DUP	Ground Water	11/11/2009 1128	11/11/2009 1715

SAMPLE RESULTS

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-25552-1

Client Sample ID: OC-GW-42S
Lab Sample ID: 360-25552-1

Date Sampled: 11/09/2009 1055
Date Received: 11/11/2009 1715
Client Matrix: Ground Water

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B Chromium	6.6	ug/L	1.3	5.0	1.0
Method: Dissolved-6010B Aluminum	260	ug/L	39	100	1.0

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-25552-1

Client Sample ID: OC-GW-42S
Lab Sample ID: 360-25552-1

Date Sampled: 11/09/2009 1055
Date Received: 11/11/2009 1715
Client Matrix: Ground Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0			Date Analyzed:	11/16/2009 2223	
Sulfate	6.4	mg/L	2.0	2.0	1.0
Chloride	44	mg/L	1.0	1.0	1.0
Method: L107-06-1B			Date Analyzed:	11/18/2009 1530	
Prep Method: Distill/Ammonia			Date Prepared:	11/18/2009 1245	
Ammonia	0.21	mg/L	0.10	0.10	1.0
Method: SM 2510B			Date Analyzed:	11/12/2009 1542	
Specific Conductance	220	umhos/cm	1.0	1.0	1.0

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-25552-1

Client Sample ID: OC-GW-201S
Lab Sample ID: 360-25552-2

Date Sampled: 11/09/2009 1405
Date Received: 11/11/2009 1715
Client Matrix: Ground Water

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B Chromium	11	ug/L	1.3	5.0	1.0
Method: Dissolved-6010B Aluminum	ND	ug/L	39	100	1.0

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-25552-1

Client Sample ID: OC-GW-201S
Lab Sample ID: 360-25552-2

Date Sampled: 11/09/2009 1405
Date Received: 11/11/2009 1715
Client Matrix: Ground Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0 Chloride	60	mg/L	10	10	10
Method: 300.0 Sulfate	1300	mg/L	40	40	20
Method: L107-06-1B Prep Method: Distill/Ammonia Ammonia	130	mg/L	1.0	1.0	10
Method: SM 2510B Specific Conductance	2800	umhos/cm	1.0	1.0	1.0

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-25552-1

Client Sample ID: OC-GW-10S
Lab Sample ID: 360-25552-3

Date Sampled: 11/10/2009 0945
Date Received: 11/11/2009 1715
Client Matrix: Ground Water

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B Chromium	ND	ug/L	1.3	5.0	1.0
Method: Dissolved-6010B Aluminum	4300	ug/L	39	100	1.0

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-25552-1

Client Sample ID: OC-GW-10S
Lab Sample ID: 360-25552-3

Date Sampled: 11/10/2009 0945
Date Received: 11/11/2009 1715
Client Matrix: Ground Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0					
			Date Analyzed:	11/19/2009 0334	
Sulfate	130	mg/L	10	10	5.0
Chloride	31	mg/L	5.0	5.0	5.0
Method: L107-06-1B					
			Date Analyzed:	11/24/2009 1513	
Prep Method: Distill/Ammonia			Date Prepared:	11/24/2009 0906	
Ammonia	7.8	mg/L	0.10	0.10	1.0
Method: SM 2510B					
			Date Analyzed:	11/12/2009 1545	
Specific Conductance	390	umhos/cm	1.0	1.0	1.0

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-25552-1

Client Sample ID: OC-GW-26
Lab Sample ID: 360-25552-4

Date Sampled: 11/10/2009 0950
Date Received: 11/11/2009 1715
Client Matrix: Ground Water

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B Chromium	6.9	ug/L	1.3	5.0	1.0
Method: Dissolved-6010B Aluminum	ND	ug/L	39	100	1.0

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-25552-1

Client Sample ID: OC-GW-26
Lab Sample ID: 360-25552-4

Date Sampled: 11/10/2009 0950
Date Received: 11/11/2009 1715
Client Matrix: Ground Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0					
			Date Analyzed:	11/17/2009 0054	
Sulfate	68	mg/L	2.0	2.0	1.0
Chloride	18	mg/L	1.0	1.0	1.0
Method: L107-06-1B					
Prep Method: Distill/Ammonia					
			Date Analyzed:	11/24/2009 1557	
			Date Prepared:	11/24/2009 0906	
Ammonia	28	mg/L	0.50	0.50	5.0
Method: SM 2510B					
			Date Analyzed:	11/12/2009 1546	
Specific Conductance	360	umhos/cm	1.0	1.0	1.0

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-25552-1

Client Sample ID: OC-GW-76S
Lab Sample ID: 360-25552-5

Date Sampled: 11/10/2009 1110
Date Received: 11/11/2009 1715
Client Matrix: Ground Water

Analyte	Result/Qualifier		Unit	MDL	RL	Dilution
Method: Dissolved-6010B Chromium	2.0	J	ug/L	1.3	5.0	1.0
Method: Dissolved-6010B Aluminum	ND		ug/L	39	100	1.0

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-25552-1

Client Sample ID: OC-GW-76S
Lab Sample ID: 360-25552-5

Date Sampled: 11/10/2009 1110
Date Received: 11/11/2009 1715
Client Matrix: Ground Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0					
			Date Analyzed:	11/17/2009 0109	
Sulfate	35	mg/L	2.0	2.0	1.0
Chloride	3.1	mg/L	1.0	1.0	1.0
Method: L107-06-1B					
Prep Method: Distill/Ammonia					
			Date Analyzed:	11/24/2009 1515	
			Date Prepared:	11/24/2009 0906	
Ammonia	8.3	mg/L	0.10	0.10	1.0
Method: SM 2510B					
			Date Analyzed:	11/12/2009 1548	
Specific Conductance	150	umhos/cm	1.0	1.0	1.0

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-25552-1

Client Sample ID: OC-GW-24
Lab Sample ID: 360-25552-6

Date Sampled: 11/10/2009 1050
Date Received: 11/11/2009 1715
Client Matrix: Ground Water

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B Chromium	ND	ug/L	1.3	5.0	1.0
Method: Dissolved-6010B Aluminum	ND	ug/L	39	100	1.0

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-25552-1

Client Sample ID: OC-GW-24
Lab Sample ID: 360-25552-6

Date Sampled: 11/10/2009 1050
Date Received: 11/11/2009 1715
Client Matrix: Ground Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0					
			Date Analyzed:	11/17/2009 0124	
Sulfate	62	mg/L	2.0	2.0	1.0
Chloride	6.5	mg/L	1.0	1.0	1.0
Method: L107-06-1B					
Prep Method: Distill/Ammonia					
			Date Analyzed:	11/24/2009 1558	
			Date Prepared:	11/24/2009 0906	
Ammonia	38	mg/L	0.50	0.50	5.0
Method: SM 2510B					
			Date Analyzed:	11/12/2009 1549	
Specific Conductance	360	umhos/cm	1.0	1.0	1.0

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-25552-1

Client Sample ID: OC-GW-25
Lab Sample ID: 360-25552-7

Date Sampled: 11/10/2009 1145
Date Received: 11/11/2009 1715
Client Matrix: Ground Water

Analyte	Result/Qualifier		Unit	MDL	RL	Dilution
Method: Dissolved-6010B Chromium	1.6	J	ug/L	1.3	5.0	1.0
Method: Dissolved-6010B Aluminum	ND		ug/L	39	100	1.0

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-25552-1

Client Sample ID: OC-GW-25
Lab Sample ID: 360-25552-7

Date Sampled: 11/10/2009 1145
Date Received: 11/11/2009 1715
Client Matrix: Ground Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0					
			Date Analyzed:	11/18/2009 2203	
Sulfate	100	mg/L	10	10	5.0
Chloride	63	mg/L	5.0	5.0	5.0
Method: L107-06-1B					
Prep Method: Distill/Ammonia			Date Analyzed:	11/24/2009 1559	
			Date Prepared:	11/24/2009 0906	
Ammonia	41	mg/L	1.0	1.0	10
Method: SM 2510B					
Specific Conductance	640	umhos/cm	1.0	1.0	1.0

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-25552-1

Client Sample ID: OC-GW-79S
Lab Sample ID: 360-25552-8

Date Sampled: 11/10/2009 1240
Date Received: 11/11/2009 1715
Client Matrix: Ground Water

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B Chromium	8.9	ug/L	1.3	5.0	1.0
Method: Dissolved-6010B Aluminum	ND	ug/L	39	100	1.0

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-25552-1

Client Sample ID: OC-GW-79S
Lab Sample ID: 360-25552-8

Date Sampled: 11/10/2009 1240
Date Received: 11/11/2009 1715
Client Matrix: Ground Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0 Chloride	210	mg/L	10	10	10
Method: 300.0 Sulfate	1400	mg/L	40	40	20
Method: L107-06-1B Prep Method: Distill/Ammonia Ammonia	190	mg/L	2.0	2.0	20
Method: SM 2510B Specific Conductance	3400	umhos/cm	1.0	1.0	1.0

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-25552-1

Client Sample ID: OC-GW-78S
Lab Sample ID: 360-25552-9

Date Sampled: 11/11/2009 1245
Date Received: 11/11/2009 1715
Client Matrix: Ground Water

Analyte	Result/Qualifier		Unit	MDL	RL	Dilution
Method: Dissolved-6010B Chromium	2.1	J	ug/L	1.3	5.0	1.0
Method: Dissolved-6010B Aluminum	ND		ug/L	39	100	1.0

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-25552-1

Client Sample ID: OC-GW-78S
Lab Sample ID: 360-25552-9

Date Sampled: 11/11/2009 1245
Date Received: 11/11/2009 1715
Client Matrix: Ground Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0 Chloride	22	mg/L	1.0	1.0	1.0
Method: 300.0 Sulfate	540	mg/L	20	20	10
Method: L107-06-1B Prep Method: Distill/Ammonia Ammonia	61	mg/L	1.0	1.0	10
Method: SM 2510B Specific Conductance	1300	umhos/cm	1.0	1.0	1.0

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-25552-1

Client Sample ID: OC-GW-202S
Lab Sample ID: 360-25552-10

Date Sampled: 11/11/2009 1128
Date Received: 11/11/2009 1715
Client Matrix: Ground Water

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B Chromium	4.8 J	ug/L	1.3	5.0	1.0
Method: Dissolved-6010B Aluminum	ND	ug/L	39	100	1.0

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-25552-1

Client Sample ID: OC-GW-202S
Lab Sample ID: 360-25552-10

Date Sampled: 11/11/2009 1128
Date Received: 11/11/2009 1715
Client Matrix: Ground Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0				Date Analyzed: 11/16/2009 2137	
Sulfate	380	mg/L	20	20	10
Chloride	45	mg/L	10	10	10
Method: L107-06-1B				Date Analyzed: 11/18/2009 1541	
Prep Method: Distill/Ammonia				Date Prepared: 11/18/2009 1245	
Ammonia	69	mg/L	1.0	1.0	10
Method: SM 2510B				Date Analyzed: 11/12/2009 1622	
Specific Conductance	1200	umhos/cm	1.0	1.0	1.0

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-25552-1

Client Sample ID: OC-PZ-16RR
Lab Sample ID: 360-25552-11

Date Sampled: 11/10/2009 1305
Date Received: 11/11/2009 1715
Client Matrix: Ground Water

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B Chromium	6.5	ug/L	1.3	5.0	1.0
Method: Dissolved-6010B Aluminum	ND	ug/L	39	100	1.0

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-25552-1

Client Sample ID: OC-PZ-16RR
Lab Sample ID: 360-25552-11

Date Sampled: 11/10/2009 1305
Date Received: 11/11/2009 1715
Client Matrix: Ground Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0			Date Analyzed:	11/18/2009 2304	
Sulfate	970	mg/L	20	20	10
Chloride	190	mg/L	10	10	10
Method: L107-06-1B			Date Analyzed:	11/24/2009 1602	
Prep Method: Distill/Ammonia			Date Prepared:	11/24/2009 0906	
Ammonia	230	mg/L	2.0	2.0	20
Method: SM 2510B			Date Analyzed:	11/12/2009 1625	
Specific Conductance	3000	umhos/cm	1.0	1.0	1.0

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-25552-1

Client Sample ID: OC-PZ-17RR
Lab Sample ID: 360-25552-12

Date Sampled: 11/10/2009 1350
Date Received: 11/11/2009 1715
Client Matrix: Ground Water

Analyte	Result/Qualifier		Unit	MDL	RL	Dilution
Method: Dissolved-6010B Chromium	3.0	J	ug/L	1.3	5.0	1.0
Method: Dissolved-6010B Aluminum	ND		ug/L	39	100	1.0

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-25552-1

Client Sample ID: OC-PZ-17RR
Lab Sample ID: 360-25552-12

Date Sampled: 11/10/2009 1350
Date Received: 11/11/2009 1715
Client Matrix: Ground Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0 Chloride	18	mg/L	1.0	1.0	1.0
Method: 300.0 Sulfate	470	mg/L	20	20	10
Method: L107-06-1B Prep Method: Distill/Ammonia Ammonia	58	mg/L	1.0	1.0	10
Method: SM 2510B Specific Conductance	1400	umhos/cm	1.0	1.0	1.0

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-25552-1

Client Sample ID: OC-PZ-18R
Lab Sample ID: 360-25552-13

Date Sampled: 11/10/2009 1505
Date Received: 11/11/2009 1715
Client Matrix: Ground Water

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B Chromium	13	ug/L	1.3	5.0	1.0
Method: Dissolved-6010B Aluminum	ND	ug/L	39	100	1.0

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-25552-1

Client Sample ID: OC-PZ-18R
Lab Sample ID: 360-25552-13

Date Sampled: 11/10/2009 1505
Date Received: 11/11/2009 1715
Client Matrix: Ground Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0 Sulfate	80	mg/L	2.0	2.0	1.0
Method: 300.0 Chloride	79	mg/L	5.0	5.0	5.0
Method: L107-06-1B Prep Method: Distill/Ammonia Ammonia	26	mg/L	0.20	0.20	2.0
Method: SM 2510B Specific Conductance	570	umhos/cm	1.0	1.0	1.0

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-25552-1

Client Sample ID: OC-GW-34SR
Lab Sample ID: 360-25552-14

Date Sampled: 11/11/2009 0907
Date Received: 11/11/2009 1715
Client Matrix: Ground Water

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B Chromium	ND	ug/L	1.3	5.0	1.0
Method: Dissolved-6010B Aluminum	ND	ug/L	39	100	1.0

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-25552-1

Client Sample ID: OC-GW-34SR
Lab Sample ID: 360-25552-14

Date Sampled: 11/11/2009 0907
Date Received: 11/11/2009 1715
Client Matrix: Ground Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0					
			Date Analyzed:	11/17/2009 0340	
Sulfate	8.0	mg/L	2.0	2.0	1.0
Chloride	1.2	mg/L	1.0	1.0	1.0
Method: L107-06-1B					
Prep Method: Distill/Ammonia					
			Date Analyzed:	11/24/2009 1525	
			Date Prepared:	11/24/2009 0906	
Ammonia	0.24	mg/L	0.10	0.10	1.0
Method: SM 2510B					
			Date Analyzed:	11/12/2009 1629	
Specific Conductance	83	umhos/cm	1.0	1.0	1.0

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-25552-1

Client Sample ID: OC-GW-34D
Lab Sample ID: 360-25552-15

Date Sampled: 11/11/2009 0905
Date Received: 11/11/2009 1715
Client Matrix: Ground Water

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B Chromium	14	ug/L	1.3	5.0	1.0
Method: Dissolved-6010B Aluminum	ND	ug/L	39	100	1.0

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-25552-1

Client Sample ID: OC-GW-34D
Lab Sample ID: 360-25552-15

Date Sampled: 11/11/2009 0905
Date Received: 11/11/2009 1715
Client Matrix: Ground Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0					
		Date Analyzed:	11/16/2009	2338	
Sulfate	29	mg/L	2.0	2.0	1.0
Chloride	15	mg/L	1.0	1.0	1.0
Method: L107-06-1B					
Prep Method: Distill/Ammonia					
		Date Analyzed:	11/24/2009	1525	
		Date Prepared:	11/24/2009	0906	
Ammonia	16	mg/L	0.10	0.10	1.0
Method: SM 2510B					
		Date Analyzed:	11/12/2009	1631	
Specific Conductance	210	umhos/cm	1.0	1.0	1.0

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-25552-1

Client Sample ID: OC-GW-CA-1
Lab Sample ID: 360-25552-16

Date Sampled: 11/11/2009 1150
Date Received: 11/11/2009 1715
Client Matrix: Ground Water

Analyte	Result/Qualifier		Unit	MDL	RL	Dilution
Method: Dissolved-6010B Chromium	3.3	J	ug/L	1.3	5.0	1.0
Method: Dissolved-6010B Aluminum	ND		ug/L	39	100	1.0

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-25552-1

Client Sample ID: OC-GW-CA-1
Lab Sample ID: 360-25552-16

Date Sampled: 11/11/2009 1150
Date Received: 11/11/2009 1715
Client Matrix: Ground Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0					
		Date Analyzed:	11/17/2009 0355		
Sulfate	86	mg/L	2.0	2.0	1.0
Chloride	6.0	mg/L	1.0	1.0	1.0
Method: L107-06-1B					
Prep Method: Distill/Ammonia					
		Date Analyzed:	11/24/2009 1528		
		Date Prepared:	11/24/2009 0906		
Ammonia	1.1	mg/L	0.10	0.10	1.0
Method: SM 2510B					
		Date Analyzed:	11/12/2009 1634		
Specific Conductance	600	umhos/cm	1.0	1.0	1.0

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-25552-1

Client Sample ID: OC-GW-35S
Lab Sample ID: 360-25552-17

Date Sampled: 11/11/2009 1040
Date Received: 11/11/2009 1715
Client Matrix: Ground Water

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B			Date Analyzed:	11/13/2009 1335	
Aluminum	ND	ug/L	39	100	1.0
Chromium	19	ug/L	1.3	5.0	1.0

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-25552-1

Client Sample ID: OC-GW-35S
Lab Sample ID: 360-25552-17

Date Sampled: 11/11/2009 1040
Date Received: 11/11/2009 1715
Client Matrix: Ground Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0 Chloride	7.0	mg/L	1.0	1.0	1.0
Method: 300.0 Sulfate	190	mg/L	10	10	5.0
Method: L107-06-1B Prep Method: Distill/Ammonia Ammonia	23	mg/L	0.20	0.20	2.0
Method: SM 2510B Specific Conductance	710	umhos/cm	1.0	1.0	1.0

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-25552-1

Client Sample ID: OC-GW-202D
Lab Sample ID: 360-25552-18

Date Sampled: 11/11/2009 1150
Date Received: 11/11/2009 1715
Client Matrix: Ground Water

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B		Date Analyzed: 11/13/2009 1338			
Aluminum	11000	ug/L	39	100	1.0
Chromium	770	ug/L	1.3	5.0	1.0

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-25552-1

Client Sample ID: OC-GW-202D
Lab Sample ID: 360-25552-18

Date Sampled: 11/11/2009 1150
Date Received: 11/11/2009 1715
Client Matrix: Ground Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0 Chloride	250	mg/L	10	10	10
Method: 300.0 Sulfate	1700	mg/L	40	40	20
Method: L107-06-1B Prep Method: Distill/Ammonia Ammonia	260	mg/L	2.0	2.0	20
Method: SM 2510B Specific Conductance	4000	umhos/cm	1.0	1.0	1.0

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-25552-1

Client Sample ID: OC-GW-34D DUP
Lab Sample ID: 360-25552-19

Date Sampled: 11/11/2009 0905
Date Received: 11/11/2009 1715
Client Matrix: Ground Water

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B			Date Analyzed:	11/13/2009 1341	
Aluminum	ND	ug/L	39	100	1.0
Chromium	14	ug/L	1.3	5.0	1.0

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-25552-1

Client Sample ID: OC-GW-34D DUP
Lab Sample ID: 360-25552-19

Date Sampled: 11/11/2009 0905
Date Received: 11/11/2009 1715
Client Matrix: Ground Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0					
		Date Analyzed:	11/17/2009 0438		
Sulfate	29	mg/L	2.0	2.0	1.0
Chloride	15	mg/L	1.0	1.0	1.0
Method: L107-06-1B					
Prep Method: Distill/Ammonia					
		Date Analyzed:	11/24/2009 1535		
		Date Prepared:	11/24/2009 1333		
Ammonia	15	mg/L	0.10	0.10	1.0
Method: SM 2510B					
		Date Analyzed:	11/12/2009 1642		
Specific Conductance	210	umhos/cm	1.0	1.0	1.0

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-25552-1

Client Sample ID: OC-GW-202S DUP
Lab Sample ID: 360-25552-20

Date Sampled: 11/11/2009 1128
Date Received: 11/11/2009 1715
Client Matrix: Ground Water

Analyte	Result/Qualifier		Unit	MDL	RL	Dilution
Method: Dissolved-6010B	Date Analyzed:			11/13/2009	1344	
	Aluminum	ND	ug/L	39	100	1.0
	Chromium	4.2 J	ug/L	1.3	5.0	1.0

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-25552-1

Client Sample ID: OC-GW-202S DUP
Lab Sample ID: 360-25552-20

Date Sampled: 11/11/2009 1128
Date Received: 11/11/2009 1715
Client Matrix: Ground Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0					
		Date Analyzed:	11/19/2009	0120	
Sulfate	390	mg/L	10	10	5.0
Chloride	51	mg/L	5.0	5.0	5.0
Method: L107-06-1B					
Prep Method: Distill/Ammonia					
		Date Analyzed:	11/24/2009	1611	
Ammonia	67	mg/L	1.0	1.0	10
Method: SM 2510B					
		Date Analyzed:	11/12/2009	1644	
Specific Conductance	1200	umhos/cm	1.0	1.0	1.0

DATA REPORTING QUALIFIERS

Client: Olin Corporation

Job Number: 360-25552-1

Lab Section	Qualifier	Description
Metals	J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
General Chemistry	4	MS, MSD: The analyte present in the original sample is 4 times greater than the matrix spike concentration; therefore, control limits are not applicable.

QUALITY CONTROL RESULTS

Quality Control Results

Client: Olin Corporation

Job Number: 360-25552-1

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
Metals					
Analysis Batch:360-51645					
LCS 360-51645/13	Lab Control Sample	T	Water	6010B	
LCSD 360-51645/25	Lab Control Sample Duplicate	T	Water	6010B	
MB 360-51645/14	Method Blank	T	Water	6010B	
360-25552-1	OC-GW-42S	D	Water	6010B	
360-25552-2	OC-GW-201S	D	Water	6010B	
360-25552-3	OC-GW-10S	D	Water	6010B	
360-25552-4	OC-GW-26	D	Water	6010B	
360-25552-5	OC-GW-76S	D	Water	6010B	
360-25552-6	OC-GW-24	D	Water	6010B	
360-25552-7	OC-GW-25	D	Water	6010B	
360-25552-8	OC-GW-79S	D	Water	6010B	
360-25552-9	OC-GW-78S	D	Water	6010B	
360-25552-10	OC-GW-202S	D	Water	6010B	
360-25552-10MS	Matrix Spike	D	Water	6010B	
360-25552-10MSD	Matrix Spike Duplicate	D	Water	6010B	
Analysis Batch:360-51646					
LCS 360-51646/1	Lab Control Sample	T	Water	6010B	
LCSD 360-51646/12	Lab Control Sample Duplicate	T	Water	6010B	
MB 360-51646/2	Method Blank	T	Water	6010B	
360-25552-11	OC-PZ-16RR	D	Water	6010B	
360-25552-12	OC-PZ-17RR	D	Water	6010B	
360-25552-13	OC-PZ-18R	D	Water	6010B	
360-25552-14	OC-GW-34SR	D	Water	6010B	
360-25552-15	OC-GW-34D	D	Water	6010B	
360-25552-15MS	Matrix Spike	D	Water	6010B	
360-25552-15MSD	Matrix Spike Duplicate	D	Water	6010B	
360-25552-16	OC-GW-CA-1	D	Water	6010B	
360-25552-17	OC-GW-35S	D	Water	6010B	
360-25552-18	OC-GW-202D	D	Water	6010B	
360-25552-19	OC-GW-34D DUP	D	Water	6010B	
360-25552-20	OC-GW-202S DUP	D	Water	6010B	

Quality Control Results

Client: Olin Corporation

Job Number: 360-25552-1

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
Metals					
Analysis Batch:360-51728					
LCS 360-51728/4	Lab Control Sample	T	Water	6010B	
LCSD 360-51728/16	Lab Control Sample Duplicate	T	Water	6010B	
MB 360-51728/5	Method Blank	T	Water	6010B	
360-25552-1	OC-GW-42S	D	Water	6010B	
360-25552-2	OC-GW-201S	D	Water	6010B	
360-25552-3	OC-GW-10S	D	Water	6010B	
360-25552-4	OC-GW-26	D	Water	6010B	
360-25552-5	OC-GW-76S	D	Water	6010B	
360-25552-6	OC-GW-24	D	Water	6010B	
360-25552-7	OC-GW-25	D	Water	6010B	
360-25552-8	OC-GW-79S	D	Water	6010B	
360-25552-9	OC-GW-78S	D	Water	6010B	
360-25552-10	OC-GW-202S	D	Water	6010B	
360-25552-10MS	Matrix Spike	D	Water	6010B	
360-25552-10MSD	Matrix Spike Duplicate	D	Water	6010B	
Analysis Batch:360-51729					
LCS 360-51729/1	Lab Control Sample	T	Water	6010B	
LCSD 360-51729/11	Lab Control Sample Duplicate	T	Water	6010B	
MB 360-51729/2	Method Blank	T	Water	6010B	
360-25552-11	OC-PZ-16RR	D	Water	6010B	
360-25552-12	OC-PZ-17RR	D	Water	6010B	
360-25552-13	OC-PZ-18R	D	Water	6010B	
360-25552-14	OC-GW-34SR	D	Water	6010B	
360-25552-15	OC-GW-34D	D	Water	6010B	
360-25552-15MS	Matrix Spike	D	Water	6010B	
360-25552-15MSD	Matrix Spike Duplicate	D	Water	6010B	
360-25552-16	OC-GW-CA-1	D	Water	6010B	

Report Basis

D = Dissolved

T = Total

Quality Control Results

Client: Olin Corporation

Job Number: 360-25552-1

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
General Chemistry					
Analysis Batch:360-51608					
LCS 360-51608/3	Lab Control Sample	T	Water	SM 2510B	
MB 360-51608/1	Method Blank	T	Water	SM 2510B	
360-25552-1	OC-GW-42S	T	Water	SM 2510B	
360-25552-2	OC-GW-201S	T	Water	SM 2510B	
360-25552-3	OC-GW-10S	T	Water	SM 2510B	
360-25552-4	OC-GW-26	T	Water	SM 2510B	
360-25552-5	OC-GW-76S	T	Water	SM 2510B	
360-25552-6	OC-GW-24	T	Water	SM 2510B	
360-25552-7	OC-GW-25	T	Water	SM 2510B	
360-25552-8	OC-GW-79S	T	Water	SM 2510B	
360-25552-9	OC-GW-78S	T	Water	SM 2510B	
360-25552-10	OC-GW-202S	T	Water	SM 2510B	
360-25552-10DU	Duplicate	T	Water	SM 2510B	
360-25552-11	OC-PZ-16RR	T	Water	SM 2510B	
360-25552-12	OC-PZ-17RR	T	Water	SM 2510B	
360-25552-13	OC-PZ-18R	T	Water	SM 2510B	
360-25552-14	OC-GW-34SR	T	Water	SM 2510B	
360-25552-15	OC-GW-34D	T	Water	SM 2510B	
360-25552-15DU	Duplicate	T	Water	SM 2510B	
360-25552-16	OC-GW-CA-1	T	Water	SM 2510B	
360-25552-17	OC-GW-35S	T	Water	SM 2510B	
360-25552-18	OC-GW-202D	T	Water	SM 2510B	
Analysis Batch:360-51609					
LCS 360-51609/2	Lab Control Sample	T	Water	SM 2510B	
MB 360-51609/1	Method Blank	T	Water	SM 2510B	
360-25552-19	OC-GW-34D DUP	T	Water	SM 2510B	
360-25552-20	OC-GW-202S DUP	T	Water	SM 2510B	
360-25552-20DU	Duplicate	T	Water	SM 2510B	
Analysis Batch:360-51747					
LCS 360-51747/4	Lab Control Sample	T	Water	300.0	
MB 360-51747/3	Method Blank	T	Water	300.0	
360-25552-1	OC-GW-42S	T	Water	300.0	
360-25552-10	OC-GW-202S	T	Water	300.0	
360-25552-10MS	Matrix Spike	T	Water	300.0	
360-25552-10MSD	Matrix Spike Duplicate	T	Water	300.0	

Quality Control Results

Client: Olin Corporation

Job Number: 360-25552-1

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
General Chemistry					
Analysis Batch:360-51748					
LCS 360-51748/4	Lab Control Sample	T	Water	300.0	
MB 360-51748/3	Method Blank	T	Water	300.0	
360-25552-4	OC-GW-26	T	Water	300.0	
360-25552-5	OC-GW-76S	T	Water	300.0	
360-25552-6	OC-GW-24	T	Water	300.0	
360-25552-9	OC-GW-78S	T	Water	300.0	
360-25552-12	OC-PZ-17RR	T	Water	300.0	
360-25552-13	OC-PZ-18R	T	Water	300.0	
360-25552-14	OC-GW-34SR	T	Water	300.0	
360-25552-15	OC-GW-34D	T	Water	300.0	
360-25552-15MS	Matrix Spike	T	Water	300.0	
360-25552-15MSD	Matrix Spike Duplicate	T	Water	300.0	
360-25552-16	OC-GW-CA-1	T	Water	300.0	
360-25552-17	OC-GW-35S	T	Water	300.0	
360-25552-19	OC-GW-34D DUP	T	Water	300.0	
Prep Batch: 360-51829					
LCS 360-51829/2-A	Lab Control Sample	T	Water	Distill/Ammonia	
MB 360-51829/1-A	Method Blank	T	Water	Distill/Ammonia	
360-25552-1	OC-GW-42S	T	Water	Distill/Ammonia	
360-25552-10	OC-GW-202S	T	Water	Distill/Ammonia	
360-25552-10MS	Matrix Spike	T	Water	Distill/Ammonia	
360-25552-10MSD	Matrix Spike Duplicate	T	Water	Distill/Ammonia	
Analysis Batch:360-51839					
LCS 360-51829/2-A	Lab Control Sample	T	Water	L107-06-1B	360-51829
MB 360-51829/1-A	Method Blank	T	Water	L107-06-1B	360-51829
360-25552-1	OC-GW-42S	T	Water	L107-06-1B	360-51829
360-25552-10	OC-GW-202S	T	Water	L107-06-1B	360-51829
360-25552-10MS	Matrix Spike	T	Water	L107-06-1B	360-51829
360-25552-10MSD	Matrix Spike Duplicate	T	Water	L107-06-1B	360-51829

Quality Control Results

Client: Olin Corporation

Job Number: 360-25552-1

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
General Chemistry					
Analysis Batch:360-51958					
LCS 360-51958/4	Lab Control Sample	T	Water	300.0	
MB 360-51958/3	Method Blank	T	Water	300.0	
360-25552-2	OC-GW-201S	T	Water	300.0	
360-25552-2MS	Matrix Spike	T	Water	300.0	
360-25552-2MSD	Matrix Spike Duplicate	T	Water	300.0	
360-25552-7	OC-GW-25	T	Water	300.0	
360-25552-8	OC-GW-79S	T	Water	300.0	
360-25552-9	OC-GW-78S	T	Water	300.0	
360-25552-11	OC-PZ-16RR	T	Water	300.0	
360-25552-12	OC-PZ-17RR	T	Water	300.0	
360-25552-13	OC-PZ-18R	T	Water	300.0	
360-25552-17	OC-GW-35S	T	Water	300.0	
360-25552-18	OC-GW-202D	T	Water	300.0	
360-25552-20	OC-GW-202S DUP	T	Water	300.0	
Analysis Batch:360-51962					
LCS 360-51962/4	Lab Control Sample	T	Water	300.0	
MB 360-51962/3	Method Blank	T	Water	300.0	
360-25552-3	OC-GW-10S	T	Water	300.0	
Prep Batch: 360-52108					
LCS 360-52108/2-A	Lab Control Sample	T	Water	Distill/Ammonia	
MB 360-52108/1-A	Method Blank	T	Water	Distill/Ammonia	
360-25552-2	OC-GW-201S	T	Water	Distill/Ammonia	
360-25552-3	OC-GW-10S	T	Water	Distill/Ammonia	
360-25552-4	OC-GW-26	T	Water	Distill/Ammonia	
360-25552-5	OC-GW-76S	T	Water	Distill/Ammonia	
360-25552-6	OC-GW-24	T	Water	Distill/Ammonia	
360-25552-7	OC-GW-25	T	Water	Distill/Ammonia	
360-25552-8	OC-GW-79S	T	Water	Distill/Ammonia	
360-25552-9	OC-GW-78S	T	Water	Distill/Ammonia	
360-25552-11	OC-PZ-16RR	T	Water	Distill/Ammonia	
360-25552-12	OC-PZ-17RR	T	Water	Distill/Ammonia	
360-25552-13	OC-PZ-18R	T	Water	Distill/Ammonia	
360-25552-14	OC-GW-34SR	T	Water	Distill/Ammonia	
360-25552-15	OC-GW-34D	T	Water	Distill/Ammonia	
360-25552-15MS	Matrix Spike	T	Water	Distill/Ammonia	
360-25552-15MSD	Matrix Spike Duplicate	T	Water	Distill/Ammonia	
360-25552-16	OC-GW-CA-1	T	Water	Distill/Ammonia	
360-25552-17	OC-GW-35S	T	Water	Distill/Ammonia	
360-25552-18	OC-GW-202D	T	Water	Distill/Ammonia	

Quality Control Results

Client: Olin Corporation

Job Number: 360-25552-1

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
General Chemistry					
Prep Batch: 360-52128					
LCS 360-52128/2-A	Lab Control Sample	T	Water	Distill/Ammonia	
MB 360-52128/1-A	Method Blank	T	Water	Distill/Ammonia	
360-25552-19	OC-GW-34D DUP	T	Water	Distill/Ammonia	
360-25552-20	OC-GW-202S DUP	T	Water	Distill/Ammonia	
Analysis Batch:360-52155					
LCS 360-52108/2-A	Lab Control Sample	T	Water	L107-06-1B	360-52108
MB 360-52108/1-A	Method Blank	T	Water	L107-06-1B	360-52108
360-25552-2	OC-GW-201S	T	Water	L107-06-1B	360-52108
360-25552-3	OC-GW-10S	T	Water	L107-06-1B	360-52108
360-25552-4	OC-GW-26	T	Water	L107-06-1B	360-52108
360-25552-5	OC-GW-76S	T	Water	L107-06-1B	360-52108
360-25552-6	OC-GW-24	T	Water	L107-06-1B	360-52108
360-25552-7	OC-GW-25	T	Water	L107-06-1B	360-52108
360-25552-8	OC-GW-79S	T	Water	L107-06-1B	360-52108
360-25552-9	OC-GW-78S	T	Water	L107-06-1B	360-52108
360-25552-11	OC-PZ-16RR	T	Water	L107-06-1B	360-52108
360-25552-12	OC-PZ-17RR	T	Water	L107-06-1B	360-52108
360-25552-13	OC-PZ-18R	T	Water	L107-06-1B	360-52108
360-25552-14	OC-GW-34SR	T	Water	L107-06-1B	360-52108
360-25552-15	OC-GW-34D	T	Water	L107-06-1B	360-52108
360-25552-15MS	Matrix Spike	T	Water	L107-06-1B	360-52108
360-25552-15MSD	Matrix Spike Duplicate	T	Water	L107-06-1B	360-52108
360-25552-16	OC-GW-CA-1	T	Water	L107-06-1B	360-52108
360-25552-17	OC-GW-35S	T	Water	L107-06-1B	360-52108
360-25552-18	OC-GW-202D	T	Water	L107-06-1B	360-52108
Analysis Batch:360-52157					
LCS 360-52128/2-A	Lab Control Sample	T	Water	L107-06-1B	360-52128
MB 360-52128/1-A	Method Blank	T	Water	L107-06-1B	360-52128
360-25552-19	OC-GW-34D DUP	T	Water	L107-06-1B	360-52128
360-25552-20	OC-GW-202S DUP	T	Water	L107-06-1B	360-52128

Report Basis

T = Total

Quality Control Results

Client: Olin Corporation

Job Number: 360-25552-1

Method Blank - Batch: 360-51645

Lab Sample ID: MB 360-51645/14
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 11/13/2009 1133
Date Prepared: N/A

Analysis Batch: 360-51645
Prep Batch: N/A
Units: ug/L

Method: 6010B Preparation: N/A

Instrument ID: Varian 720 ES ICP
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume: 1.0 mL

Analyte	Result	Qual	MDL	RL
Chromium	ND		1.3	5.0

Lab Control Sample/ Lab Control Sample Duplicate Recovery Report - Batch: 360-51645

Method: 6010B Preparation: N/A

LCS Lab Sample ID: LCS 360-51645/13
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 11/13/2009 1130
Date Prepared: N/A

Analysis Batch: 360-51645
Prep Batch: N/A
Units: ug/L

Instrument ID: Varian 720 ES ICP
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume: 10 mL

LCSD Lab Sample ID: LCSD 360-51645/25
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 11/13/2009 1219
Date Prepared: N/A

Analysis Batch: 360-51645
Prep Batch: N/A
Units: ug/L

Instrument ID: Varian 720 ES ICP
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume: 10 mL

Analyte	% Rec.		Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
	LCS	LCSD					
Chromium	100	99	80 - 120	2	20		

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Olin Corporation

Job Number: 360-25552-1

Matrix Spike/

Matrix Spike Duplicate Recovery Report - Batch: 360-51645

Method: 6010B

Preparation: N/A

MS Lab Sample ID: 360-25552-10
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 11/13/2009 1216
Date Prepared: N/A

Analysis Batch: 360-51645
Prep Batch: N/A

Instrument ID: Varian 720 ES ICP
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume: 10 mL

MSD Lab Sample ID: 360-25552-10
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 11/13/2009 1224
Date Prepared: N/A

Analysis Batch: 360-51645
Prep Batch: N/A

Instrument ID: Varian 720 ES ICP
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume: 10 mL

Analyte	<u>% Rec.</u>		Limit	RPD	RPD Limit	MS Qual	MSD Qual
	MS	MSD					
Chromium	95	95	75 - 125	1	20		

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Olin Corporation

Job Number: 360-25552-1

Method Blank - Batch: 360-51646

Method: 6010B
Preparation: N/A

Lab Sample ID: MB 360-51646/2
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 11/13/2009 1258
Date Prepared: N/A

Analysis Batch: 360-51646
Prep Batch: N/A
Units: ug/L

Instrument ID: Varian 720 ES ICP
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume: 1.0 mL

Analyte	Result	Qual	MDL	RL
Aluminum	ND		39	100
Chromium	ND		1.3	5.0

Lab Control Sample/ Lab Control Sample Duplicate Recovery Report - Batch: 360-51646

Method: 6010B
Preparation: N/A

LCS Lab Sample ID: LCS 360-51646/1
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 11/13/2009 1255
Date Prepared: N/A

Analysis Batch: 360-51646
Prep Batch: N/A
Units: ug/L

Instrument ID: Varian 720 ES ICP
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume: 10 mL

LCSD Lab Sample ID: LCSD 360-51646/12
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 11/13/2009 1329
Date Prepared: N/A

Analysis Batch: 360-51646
Prep Batch: N/A
Units: ug/L

Instrument ID: Varian 720 ES ICP
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume: 10 mL

Analyte	% Rec.		Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
	LCS	LCSD					
Aluminum	89	93	80 - 120	4	20		
Chromium	93	96	80 - 120	3	20		

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Olin Corporation

Job Number: 360-25552-1

Matrix Spike/

Matrix Spike Duplicate Recovery Report - Batch: 360-51646

Method: 6010B

Preparation: N/A

MS Lab Sample ID: 360-25552-15
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 11/13/2009 1306
Date Prepared: N/A

Analysis Batch: 360-51646
Prep Batch: N/A

Instrument ID: Varian 720 ES ICP
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume: 10 mL

MSD Lab Sample ID: 360-25552-15
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 11/13/2009 1309
Date Prepared: N/A

Analysis Batch: 360-51646
Prep Batch: N/A

Instrument ID: Varian 720 ES ICP
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume: 10 mL

Analyte	<u>% Rec.</u>		Limit	RPD	RPD Limit	MS Qual	MSD Qual
	MS	MSD					
Chromium	92	97	75 - 125	4	20		

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Olin Corporation

Job Number: 360-25552-1

Method Blank - Batch: 360-51728

Lab Sample ID: MB 360-51728/5
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 11/16/2009 1624
Date Prepared: N/A

Analysis Batch: 360-51728
Prep Batch: N/A
Units: ug/L

Method: 6010B Preparation: N/A

Instrument ID: Varian 720 ES ICP
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume: 1.0 mL

Analyte	Result	Qual	MDL	RL
Aluminum	ND		39	100

Lab Control Sample/ Lab Control Sample Duplicate Recovery Report - Batch: 360-51728

Method: 6010B Preparation: N/A

LCS Lab Sample ID: LCS 360-51728/4
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 11/16/2009 1621
Date Prepared: N/A

Analysis Batch: 360-51728
Prep Batch: N/A
Units: ug/L

Instrument ID: Varian 720 ES ICP
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume: 10 mL

LCSD Lab Sample ID: LCSD 360-51728/16
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 11/16/2009 1656
Date Prepared: N/A

Analysis Batch: 360-51728
Prep Batch: N/A
Units: ug/L

Instrument ID: Varian 720 ES ICP
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume: 10 mL

Analyte	% Rec.		Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
	LCS	LCSD					
Aluminum	99	101	80 - 120	2	20		

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Olin Corporation

Job Number: 360-25552-1

Matrix Spike/

Matrix Spike Duplicate Recovery Report - Batch: 360-51728

Method: 6010B

Preparation: N/A

MS Lab Sample ID: 360-25552-10
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 11/16/2009 1627
Date Prepared: N/A

Analysis Batch: 360-51728
Prep Batch: N/A

Instrument ID: Varian 720 ES ICP
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume: 10 mL

MSD Lab Sample ID: 360-25552-10
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 11/16/2009 1630
Date Prepared: N/A

Analysis Batch: 360-51728
Prep Batch: N/A

Instrument ID: Varian 720 ES ICP
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume: 10 mL

Analyte	<u>% Rec.</u>		Limit	RPD	RPD Limit	MS Qual	MSD Qual
	MS	MSD					
Aluminum	97	102	75 - 125	5	20		

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Olin Corporation

Job Number: 360-25552-1

Method Blank - Batch: 360-51729

Lab Sample ID: MB 360-51729/2
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 11/16/2009 1659
Date Prepared: N/A

Analysis Batch: 360-51729
Prep Batch: N/A
Units: ug/L

Method: 6010B Preparation: N/A

Instrument ID: Varian 720 ES ICP
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume: 1.0 mL

Analyte	Result	Qual	MDL	RL
Aluminum	ND		39	100

Lab Control Sample/ Lab Control Sample Duplicate Recovery Report - Batch: 360-51729

Method: 6010B Preparation: N/A

LCS Lab Sample ID: LCS 360-51729/1
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 11/16/2009 1656
Date Prepared: N/A

Analysis Batch: 360-51729
Prep Batch: N/A
Units: ug/L

Instrument ID: Varian 720 ES ICP
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume: 10 mL

LCSD Lab Sample ID: LCSD 360-51729/11
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 11/16/2009 1731
Date Prepared: N/A

Analysis Batch: 360-51729
Prep Batch: N/A
Units: ug/L

Instrument ID: Varian 720 ES ICP
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume: 10 mL

Analyte	% Rec.		Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
	LCS	LCSD					
Aluminum	101	101	80 - 120	0	20		

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Olin Corporation

Job Number: 360-25552-1

Matrix Spike/

Matrix Spike Duplicate Recovery Report - Batch: 360-51729

Method: 6010B

Preparation: N/A

MS Lab Sample ID: 360-25552-15
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 11/16/2009 1711
Date Prepared: N/A

Analysis Batch: 360-51729
Prep Batch: N/A

Instrument ID: Varian 720 ES ICP
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume: 10 mL

MSD Lab Sample ID: 360-25552-15
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 11/16/2009 1714
Date Prepared: N/A

Analysis Batch: 360-51729
Prep Batch: N/A

Instrument ID: Varian 720 ES ICP
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume: 10 mL

Analyte	<u>% Rec.</u>		Limit	RPD	RPD Limit	MS Qual	MSD Qual
	MS	MSD					
Aluminum	104	104	75 - 125	0	20		

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Olin Corporation

Job Number: 360-25552-1

Method Blank - Batch: 360-51747

Method: 300.0

Preparation: N/A

Lab Sample ID: MB 360-51747/3
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 11/16/2009 1603
Date Prepared: N/A

Analysis Batch: 360-51747
Prep Batch: N/A
Units: mg/L

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 1.0 mL

Analyte	Result	Qual	RL	RL
Sulfate	ND		2.0	2.0
Chloride	ND		1.0	1.0

Lab Control Sample - Batch: 360-51747

Method: 300.0

Preparation: N/A

Lab Sample ID: LCS 360-51747/4
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 11/16/2009 1618
Date Prepared: N/A

Analysis Batch: 360-51747
Prep Batch: N/A
Units: mg/L

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 1.0 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Sulfate	80.0	79.5	99	85 - 115	
Chloride	40.0	40.7	102	85 - 115	

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Olin Corporation

Job Number: 360-25552-1

Matrix Spike/

Matrix Spike Duplicate Recovery Report - Batch: 360-51747

Method: 300.0

Preparation: N/A

MS Lab Sample ID: 360-25552-10
Client Matrix: Water
Dilution: 10
Date Analyzed: 11/16/2009 2153
Date Prepared: N/A

Analysis Batch: 360-51747
Prep Batch: N/A

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 10 mL

MSD Lab Sample ID: 360-25552-10
Client Matrix: Water
Dilution: 10
Date Analyzed: 11/16/2009 2208
Date Prepared: N/A

Analysis Batch: 360-51747
Prep Batch: N/A

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 10 mL

Analyte	<u>% Rec.</u>		Limit	RPD	RPD Limit	MS Qual	MSD Qual
	MS	MSD					
Sulfate	101	101	75 - 125	0	20		
Chloride	107	106	75 - 125	0	20		

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Olin Corporation

Job Number: 360-25552-1

Method Blank - Batch: 360-51748

Method: 300.0

Preparation: N/A

Lab Sample ID: MB 360-51748/3
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 11/16/2009 2308
Date Prepared: N/A

Analysis Batch: 360-51748
Prep Batch: N/A
Units: mg/L

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 1.0 mL

Analyte	Result	Qual	RL	RL
Sulfate	ND		2.0	2.0
Chloride	ND		1.0	1.0

Lab Control Sample - Batch: 360-51748

Method: 300.0

Preparation: N/A

Lab Sample ID: LCS 360-51748/4
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 11/16/2009 2323
Date Prepared: N/A

Analysis Batch: 360-51748
Prep Batch: N/A
Units: mg/L

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 1.0 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Sulfate	80.0	81.7	102	85 - 115	
Chloride	40.0	41.1	103	85 - 115	

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Olin Corporation

Job Number: 360-25552-1

Matrix Spike/

Matrix Spike Duplicate Recovery Report - Batch: 360-51748

Method: 300.0

Preparation: N/A

MS Lab Sample ID: 360-25552-15
Client Matrix: Water
Dilution: 10
Date Analyzed: 11/17/2009 0008
Date Prepared: N/A

Analysis Batch: 360-51748
Prep Batch: N/A

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 10 mL

MSD Lab Sample ID: 360-25552-15
Client Matrix: Water
Dilution: 10
Date Analyzed: 11/17/2009 0024
Date Prepared: N/A

Analysis Batch: 360-51748
Prep Batch: N/A

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 10 mL

Analyte	<u>% Rec.</u>		Limit	RPD	RPD Limit	MS Qual	MSD Qual
	MS	MSD					
Sulfate	106	104	75 - 125	2	20		
Chloride	112	111	75 - 125	1	20		

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Olin Corporation

Job Number: 360-25552-1

Method Blank - Batch: 360-51958

Method: 300.0

Preparation: N/A

Lab Sample ID: MB 360-51958/3
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 11/18/2009 2031
Date Prepared: N/A

Analysis Batch: 360-51958
Prep Batch: N/A
Units: mg/L

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 1.0 mL

Analyte	Result	Qual	RL	RL
Sulfate	ND		2.0	2.0
Chloride	ND		1.0	1.0

Lab Control Sample - Batch: 360-51958

Method: 300.0

Preparation: N/A

Lab Sample ID: LCS 360-51958/4
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 11/18/2009 2046
Date Prepared: N/A

Analysis Batch: 360-51958
Prep Batch: N/A
Units: mg/L

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 1.0 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Sulfate	80.0	81.0	101	85 - 115	
Chloride	40.0	41.7	104	85 - 115	

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Olin Corporation

Job Number: 360-25552-1

Matrix Spike/

Matrix Spike Duplicate Recovery Report - Batch: 360-51958

Method: 300.0

Preparation: N/A

MS Lab Sample ID: 360-25552-2
Client Matrix: Water
Dilution: 20
Date Analyzed: 11/18/2009 2131
Date Prepared: N/A

Analysis Batch: 360-51958
Prep Batch: N/A

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 10 mL

MSD Lab Sample ID: 360-25552-2
Client Matrix: Water
Dilution: 20
Date Analyzed: 11/18/2009 2147
Date Prepared: N/A

Analysis Batch: 360-51958
Prep Batch: N/A

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 10 mL

Analyte	<u>% Rec.</u>		Limit	RPD	RPD Limit	MS Qual	MSD Qual
	MS	MSD					
Sulfate	95	95	75 - 125	0	20		
Chloride	119	119	75 - 125	0	20		

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Olin Corporation

Job Number: 360-25552-1

Method Blank - Batch: 360-51962

Method: 300.0

Preparation: N/A

Lab Sample ID: MB 360-51962/3
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 11/19/2009 0304
Date Prepared: N/A

Analysis Batch: 360-51962
Prep Batch: N/A
Units: mg/L

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 1.0 mL

Analyte	Result	Qual	RL	RL
Sulfate	ND		2.0	2.0
Chloride	ND		1.0	1.0

Lab Control Sample - Batch: 360-51962

Method: 300.0

Preparation: N/A

Lab Sample ID: LCS 360-51962/4
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 11/19/2009 0319
Date Prepared: N/A

Analysis Batch: 360-51962
Prep Batch: N/A
Units: mg/L

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 1.0 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Sulfate	80.0	83.1	104	85 - 115	
Chloride	40.0	42.2	105	85 - 115	

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Olin Corporation

Job Number: 360-25552-1

Method Blank - Batch: 360-51829

Lab Sample ID: MB 360-51829/1-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 11/18/2009 1525
Date Prepared: 11/18/2009 1245

Analysis Batch: 360-51839
Prep Batch: 360-51829
Units: mg/L

Method: L107-06-1B Preparation: Distill/Ammonia

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 50 mL

Analyte	Result	Qual	RL	RL
Ammonia	ND		0.10	0.10

Lab Control Sample - Batch: 360-51829

Lab Sample ID: LCS 360-51829/2-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 11/18/2009 1526
Date Prepared: 11/18/2009 1245

Analysis Batch: 360-51839
Prep Batch: 360-51829
Units: mg/L

Method: L107-06-1B Preparation: Distill/Ammonia

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 50 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Ammonia	10.0	9.59	96	85 - 115	

Matrix Spike/ Matrix Spike Duplicate Recovery Report - Batch: 360-51829

Method: L107-06-1B Preparation: Distill/Ammonia

MS Lab Sample ID: 360-25552-10
Client Matrix: Water
Dilution: 10
Date Analyzed: 11/18/2009 1542
Date Prepared: 11/18/2009 1245

Analysis Batch: 360-51839
Prep Batch: 360-51829

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 50 mL

MSD Lab Sample ID: 360-25552-10
Client Matrix: Water
Dilution: 10
Date Analyzed: 11/18/2009 1543
Date Prepared: 11/18/2009 1245

Analysis Batch: 360-51839
Prep Batch: 360-51829

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 50 mL

Analyte	% Rec.		Limit	RPD	RPD Limit	MS Qual	MSD Qual
	MS	MSD					
Ammonia	130	153	75 - 125	3	20	4	4

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Olin Corporation

Job Number: 360-25552-1

Method Blank - Batch: 360-52108

Lab Sample ID: MB 360-52108/1-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 11/24/2009 1510
Date Prepared: 11/24/2009 0906

Analysis Batch: 360-52155
Prep Batch: 360-52108
Units: mg/L

Method: L107-06-1B Preparation: Distill/Ammonia

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 50 mL

Analyte	Result	Qual	RL	RL
Ammonia	ND		0.10	0.10

Lab Control Sample - Batch: 360-52108

Lab Sample ID: LCS 360-52108/2-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 11/24/2009 1511
Date Prepared: 11/24/2009 0906

Analysis Batch: 360-52155
Prep Batch: 360-52108
Units: mg/L

Method: L107-06-1B Preparation: Distill/Ammonia

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 50 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Ammonia	10.0	9.74	97	85 - 115	

Matrix Spike/ Matrix Spike Duplicate Recovery Report - Batch: 360-52108

Method: L107-06-1B Preparation: Distill/Ammonia

MS Lab Sample ID: 360-25552-15
Client Matrix: Water
Dilution: 2.0
Date Analyzed: 11/24/2009 1605
Date Prepared: 11/24/2009 0906

Analysis Batch: 360-52155
Prep Batch: 360-52108

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 50 mL

MSD Lab Sample ID: 360-25552-15
Client Matrix: Water
Dilution: 2.0
Date Analyzed: 11/24/2009 1608
Date Prepared: 11/24/2009 0906

Analysis Batch: 360-52155
Prep Batch: 360-52108

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 50 mL

Analyte	% Rec.		Limit	RPD	RPD Limit	MS Qual	MSD Qual
	MS	MSD					
Ammonia	116	118	75 - 125	1	20		

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Olin Corporation

Job Number: 360-25552-1

Method Blank - Batch: 360-52128

Lab Sample ID: MB 360-52128/1-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 11/24/2009 1533
Date Prepared: 11/24/2009 1333

Analysis Batch: 360-52157
Prep Batch: 360-52128
Units: mg/L

Method: L107-06-1B Preparation: Distill/Ammonia

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 50 mL

Analyte	Result	Qual	RL	RL
Ammonia	ND		0.10	0.10

Lab Control Sample - Batch: 360-52128

Lab Sample ID: LCS 360-52128/2-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 11/24/2009 1534
Date Prepared: 11/24/2009 1333

Analysis Batch: 360-52157
Prep Batch: 360-52128
Units: mg/L

Method: L107-06-1B Preparation: Distill/Ammonia

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 50 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Ammonia	10.0	10.3	103	85 - 115	

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Olin Corporation

Job Number: 360-25552-1

Method Blank - Batch: 360-51608

Method: SM 2510B
Preparation: N/A

Lab Sample ID: MB 360-51608/1
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 11/12/2009 1537
Date Prepared: N/A

Analysis Batch: 360-51608
Prep Batch: N/A
Units: umhos/cm

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume: 1.0 mL

Analyte	Result	Qual	RL	RL
Specific Conductance	ND		1.0	1.0

Lab Control Sample - Batch: 360-51608

Method: SM 2510B
Preparation: N/A

Lab Sample ID: LCS 360-51608/3
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 11/12/2009 1540
Date Prepared: N/A

Analysis Batch: 360-51608
Prep Batch: N/A
Units: umhos/cm

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume: 1.0 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Specific Conductance	1410	1400	99	85 - 115	

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Olin Corporation

Job Number: 360-25552-1

Duplicate - Batch: 360-51608

Method: SM 2510B

Preparation: N/A

Lab Sample ID: 360-25552-10
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 11/12/2009 1623
Date Prepared: N/A

Analysis Batch: 360-51608
Prep Batch: N/A
Units: umhos/cm

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume: 1.0 mL

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Specific Conductance	1200	1210	0	20	

Duplicate - Batch: 360-51608

Method: SM 2510B

Preparation: N/A

Lab Sample ID: 360-25552-15
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 11/12/2009 1632
Date Prepared: N/A

Analysis Batch: 360-51608
Prep Batch: N/A
Units: umhos/cm

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume: 1.0 mL

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Specific Conductance	210	206	0	20	

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Olin Corporation

Job Number: 360-25552-1

Method Blank - Batch: 360-51609

Method: SM 2510B
Preparation: N/A

Lab Sample ID: MB 360-51609/1
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 11/12/2009 1639
Date Prepared: N/A

Analysis Batch: 360-51609
Prep Batch: N/A
Units: umhos/cm

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume: 1.0 mL

Analyte	Result	Qual	RL	RL
Specific Conductance	ND		1.0	1.0

Lab Control Sample - Batch: 360-51609

Method: SM 2510B
Preparation: N/A

Lab Sample ID: LCS 360-51609/2
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 11/12/2009 1641
Date Prepared: N/A

Analysis Batch: 360-51609
Prep Batch: N/A
Units: umhos/cm

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume: 1.0 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Specific Conductance	1410	1390	98	85 - 115	

Duplicate - Batch: 360-51609

Method: SM 2510B
Preparation: N/A

Lab Sample ID: 360-25552-20
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 11/12/2009 1645
Date Prepared: N/A

Analysis Batch: 360-51609
Prep Batch: N/A
Units: umhos/cm

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume: 1.0 mL

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Specific Conductance	1200	1240	0	20	

Calculations are performed before rounding to avoid round-off errors in calculated results.

State Accreditation Matrix

Method Name	Description	State where Primary Accreditation is Carried				
		New York (NELAC)	Mass	Conn	Florida (NELAC)	North Carolina
821-R-02-012	Toxicity, Acute (48-Hour)(list upon request)				NP	
SM 4500 Cl F	Chlorine, Residual		NP			
SM 9215B	Heterotrophic Plate Count (Pour Plate Method)		P			
SM 9215E	Heterotrophic Plate Count (SimPlate)		P			
SM 9221F	E.Coli (Multiple-Tube Fermentation; EC-MUG)		P			
SM 9222B	Coliforms, Total (Membrane Filter)		P			
SM 9222D	Coliforms, Fecal (Membrane Filter)		P/NP			
SM 9223	Coliforms, Total, and E.Coli (Colilert-P/A)		P			
200.8	Metals (ICP/MS) (list upon request)	NP/P	NP/P	NP/P		
200.7 Rev 4.4	Metals (ICP)(list upon request)	NP/P	NP/P	NP/P		
6010B	Metals (ICP)(list upon request)	NP/SW		NP/SW		
245.1	Mercury (CVAA)	NP/P	NP	NP/P		
7470A	Mercury (CVAA)	NP		NP		
7471A	Mercury (CVAA)	SW		SW		
SM 2340B	Total Hardness (as CaCO3) by calculation	NP/P	NP	NP/P		
3005A	Preparation, Total Recoverable or Dissolved Metals	NP/P		NP/P		
3010A	Preparation, Total Metals	NP/P		NP/P		
3020A	Preparation, Total Metals	NP/P/SW		NP/P/SW		
3050B	Preparation, Metals	SW		SW		
504.1	EDB, DBCP and 1,2,3-TCP (GC)		P	P		
608	Organochlorine Pest/PCBs (list upon request)	NP	NP	NP		
625	Semivolatile Org Comp (GC/MS)(list upon request)	NP		NP		
3546	Microwave Extraction	SW				
3510C	Liquid-Liquid Extraction (Separatory Funnel)	NP		NP		
3540C	Soxhlet Extraction					
3550B	Ultrasonic Extraction	SW		SW		
600/4-81-045	Polychlorinated Biphenyls (PCBs) (GC)		NP	NP		
8081A	Organochlorine Pesticides (GC)(list upon request)	NP/SW		NP/SW		
8082A	PCBs by Gas Chromatography(list upon request)	NP/SW		NP/SW		
8270C	Semivolatile Comp.(GC/MS)(list upon request)	NP/SW		NP/SW		
CT ETPH	Conn - Ext. Total petroleum Hydrocarbons (GC)			NP/SW		
MA-EPH	Mass - Extractable Petroleum Hydrocarbons (GC)			NP/SW		NP/SW
524.2	Volatile Org Comp (GC/MS)(list upon request)	P	P	P		
524.2	Trihalomethanes		P	P		
624	Volatile Org Comp (GC/MS)(list upon request)	NP	NP	NP		
5035	Closed System Purge and Trap	SW		SW		
5030B	Purge and Trap	NP		NP		
8260B	Volatile Org Comp. (GC/MS)(list upon request)	NP/SW		NP/SW		
MAVPH	Mass - Volatile Petroleum Hydrocarbons (GC)			NP/SW		NP/SW
180.1	Turbidity, Nephelometric		P	P		
300	Anions, Ion Chromatography	NP/P	NP/P	NP/P		
410.4	COD	NP	NP	NP		
1010	Ignitability, Pensky-Martens Closed-Cup Method	SW		SW		
10-107-06-2	Nitrogen, Total Kjeldahl	NP	NP	NP		
7196A	Chromium, Hexavalent	NP/SW		NP/SW		
9012A	Cyanide, Total and/or Amenable	NP/SW		NP/SW		
9030B	Sulfide, Distillation (Acid Soluble and Insoluble)	NP		NP		
9040B	pH	NP		NP		
9045C	pH	SW		SW		
L107041C	Nitrogen, Nitrate	NP	P	NP/P		
L107-06-1B	Nitrogen Ammonia	NP	NP	NP/P		
L204001A CN	Cyanide, Total		NP/P	NP/P		
L210-001A	Phenolics, Total Recoverable	NP	NP	NP		
SM 2320B	Alkalinity	NP/P	NP/P	NP/P		
SM 2510B	Conductivity, Specific Conductance	NP/P	NP/P	NP/P		
SM 2540C	Solids, Total Dissolved (TDS)	NP/P	NP/P	NP/P		
SM 2540D	Solids, Total Suspended (TSS)	NP	NP	NP		
SM 3500 CR D	Chromium, Hexavalent	NP		NP		
SM 4500 H+ B	pH	NP/P	NP/P	NP/P		
SM 4500 NO2 B	Nitrogen, Nitrite	NP	P	NP/P		
SM 4500 P E	Phosphorus, Orthophosphate	NP/P	NP	NP/P		
SM 4500 P E	Phosphorus, Total	NP	NP	NP		
SM 4500 S2 D	Sulfide, Total	NP		NP		
SM 5210B	BOD, 5-Day	NP	NP	NP		
SM 5310B	Organic Carbon, Total (TOC)	NP	NP	NP/P		

Not all organic compounds are accredited under NELAC

For methods with multiple compounds all compounds may not meet NELAC criteria, listing should be obtained from the laboratory

The lab carries additional accreditations with several states. This is listing is subject to change based on the laboratories current certification standing.

Login Sample Receipt Check List

Client: Olin Corporation

Job Number: 360-25552-1

Login Number: 25552

List Source: TestAmerica Westfield

Creator: Rinard, Kimberley A

List Number: 1

Question	T / F / NA	Comment
Radioactivity either was not measured or, if measured, is at or below background	N/A	
The cooler's custody seal, if present, is intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	5.6 C
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	N/A	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Is the Field Sampler's name present on COC?	True	
Sample Preservation Verified	True	

•53 Southampton Road
Westfield, MA 01085
(P) 413-572-4000
(F) 413-572-3707

Page 87 of 89

•53 Southampton Road
Westfield, MA 01085
(P) 413-572-4000
(F) 413-572-3707

Page 88 of 89

TestAmerica

•53 Southampton Road
Westfield, MA 01085
(P) 413-572-4000
(F) 413-572-3707

Client: Olin Chemical/MACTEC		Project #: 6107-09-0016.04		Job# 360 1852		Quote#		PO#	
Address: 51 Eames Street Wilmington, MA 01887		Project Manager: P. Thompson		Shaded areas for office use		Comments (Special Instructions)			
Phone: _____ Fax: _____		Work ID: Groundwater		Analysis Requested		MCP case narrative			
Requested Turn Around Time 10 Business Day (Std) <u>XX</u> 15 Business Day _____ Other _____		Rush TAT Requested: 24 hrs _____ 72 hrs _____ 48 hrs _____ 5 Day _____		Regulatory Classification / Special Report Format NPDES _____ Drinking Water _____ DEP Form(s) _____ RCRA _____ MCP GW/IS1 _____ MWRA Smart Rpt _____ Other _____ MCP QA/QC Rpt <u>XX</u>		Check analysis and specify method and analytes in comments section. For example: 500-series for drinking water 600-series for waste water 8000-series for hazardous waste Use comments section to further define.			
Sample Type Codes WW-Wastewater DW-Drinking water SW-Surface water LW-Labwater GW-Groundwater A-Air S-Solid / Soil SL-Sludge O-Oil Z-Other		Sample ID		Sample Type		Sampler's Initials		Date	
								Time	
								Collected	
								Grab	
								Comp.	
								# Containers	
								Plastic(P) or Glass(G)	
								NaHSO4/MeOH	
								HNO3 to pH <2	
								H2SO4 to pH <2	
								HCl to pH <2	
								NaOH to pH >12	
								NaOH/ZNAC	
								None / 4° C	
								Ammonia-Nitrogen	
								Chloride, Sulfate	
								Specific Conductivity	
								Diss. Al/Cr by 6010B	
								Groundwater metals	
								8260B TMPs only	
								8270C NDPA/BEHP	
								VPH (MAVPH)	
								Dissolved Fe by 6010B	
								pH by SM4500H+B	
								Other _____	
								Other _____	
								Other _____	

Sampled by (print): David Chapman / Chris Mazzilli		Signature: _____	
Relinquished by: David Chapman		Date: 11/11/09	
Relinquished by: Chris Mazzilli		Date: 11/11/09	
Method of shipment: _____		Time: 15:10	
Received by: Chris Mazzilli		Date: 11/11/09	
Received by: Chris Mazzilli		Date: 11/11/09	
Time: 17:15		Time: 15:30	
TestAmerica-Westfield		Time: 17:15	

Cooler ? (V) N Samples Iced (X) N	
Temp @ receipt: 5.6°	°C
Preservation/pH checked	
By: Chris Mazzilli	Date: 11/11/09

Analysis--

Ammonia Nitrogen--Lac 107-06-08

Chloride/sulfate--EPA 300

Specific Conductivity--SM 2510B

Dissolved metals are field filtered.

OLIN-WILMINGTON
LEVEL I DATA QUALITY EVALUATION
STANDARD OPERATING PROCEDURE AND CHECKLIST
ICP METALS BY METHOD 6010B/200.7

Reviewer/Date Chris Ricardi 3/17/10
Sr. Review/Date _____
Lab Report # 25553
Project # 6107100016

Al, Cr, Fe only

1.0 Laboratory Deliverable Requirements

1.1 Laboratory Information: Was all of the following provided in the laboratory report? Yes ☒ No ☐ N/A ☐ Comments: No Qual

Check items received.

☒ Name of Laboratory ☒ Address ☒ Project ID ☒ Phone # ☒ Sample identification – Field and Laboratory

Client Information: ☒ Name ☒ Address ☒ Client Contact (IDs must be cross-referenced)

ACTION: If no, contact lab for submission of missing or illegible information.

1.2 Laboratory Report Certification Statement

Yes ☒ No ☐ N/A ☐ Comments:

Does the laboratory report include a completed Analytical Report Certification in the required format?

ACTION: If no, contact lab for submission of missing certification or certification with correct format.

1.3 Laboratory Case Narrative:

Yes ☒ No ☐ N/A ☐ Comments:

☐ Narrative serves as an exception report for the project and method QA/QC performance. ☒ Narrative includes an explanation of each discrepancy on the

Certification Statement.

ACTION: If no, contact lab for submission of missing or illegible information.

1.4 Chain of Custody (COC) copy present with all documentation completed

Yes ☒ No ☐ N/A ☐ Comments:

NOTE: Olin receives and maintains the *original* COC.

ACTION: If no, contact lab for submission of copy of completed COC.

OLIN CORPORATION
LEVEL I DATA QUALITY EVALUATION – OPTION 1
STANDARD OPERATING PROCEDURE AND CHECKLIST
ICP METALS BY METHOD 6010B/200.7

1.5 Sample Receipt Information (*Cooler Receipt Form present?*):

Yes ☒ No ☐ N/A ☐ Comments:

Were each of the following tasks completed and recorded upon receipt of the sample(s) into the laboratory?

- ☒ Sample temperature confirmed: must be 1° – 10° C. (If samples were sent by courier and delivered on the same day as collection, temperature requirement does not apply).
☒ Container type noted ☒ sample condition observed ☒ pH verified (where applicable) ☒ Field and lab IDs cross referenced

ACTION: If no, contact lab for submission of missing or incomplete documentation.

1.5.1 Were all samples delivered to the laboratory without breakage?

Yes ☒ No ☐ N/A ☐ Comments:

1.5.2 Does the *Cooler Receipt Form* or Lab Narrative indicate other problems with sample receipt, condition of the samples, analytical problems or special circumstances affecting the quality of the data?

Yes ☐ No ☒ N/A ☐ Comments:

1.6 Sample Results Section: Was each of the following requirements supplied in the laboratory report for each sample?

Yes ☐ No ☐ N/A ☐ Comments:

- ☒ Field ID and Lab ID ☒ Date and time collected ☒ Analyst Initials ☒ Dilution Factor ☒ % moisture or solids ☒ Reporting limits
☒ Clean-up method ☒ Analysis method ☒ Preparation method ☒ Date of preparation/extraction/digestion clean-up and analysis, where applicable
☒ Matrix ☒ Target analytes and concentrations ☒ Units (soils must be reported in dry weight)

ACTION: If no, contact lab for submission of missing or incomplete information.

1.7 QA/QC Information: Was each of the following information supplied in the laboratory report for each sample batch?

Yes ☒ No ☐ N/A ☐ Comments:

OLIN CORPORATION
LEVEL I DATA QUALITY EVALUATION – OPTION 1
STANDARD OPERATING PROCEDURE AND CHECKLIST
ICP METALS BY METHOD 6010B/200.7

☒ Method blank results ☒ LCS recoveries ☒ MS/MSD recoveries and RPDs ☐ Laboratory duplicate results (where applicable)

ACTION: If no, contact lab for submission of missing or incomplete information.

See LCSD, MSD

2.0 Holding Times

Have any technical holding times, determined from date of collection to date of analysis, been exceeded? Holding time for metals is 180 days from sample collection to analysis for both water and soil. Yes ☐ No ☒ N/A ☐ Comments:

NOTE: List samples that exceed hold time with # of days exceeded on checklist

ACTION: If technical holding times are exceeded, qualify all positive results (J) and non-detects (UJ). If grossly exceeded (2X holding time) reject (R) all non-detect results.

3.0 Laboratory Method

3.1 Was the correct laboratory method used? Yes ☒ No ☐ N/A ☐ Comments:

Water Digestion 3005A or 3010A or 3020A
Soil Digestion 3050B
Metals ☒ 6010B or 200.7

ACTION: If no, contact laboratory to provide justification for method change compared to the requested method. Contact senior chemist to inform Client of change and to request variance.

3.2 Are the practical quantitation limits the same as those specified by the Yes ☒ No ☐ N/A ☐ Comments:
☐ SOW ☒ QAPP ☐ Lab ☐ MADEP

NOTE: Verify that the reported metals match the target list specified on the COC.

OLIN CORPORATION
LEVEL I DATA QUALITY EVALUATION – OPTION 1
STANDARD OPERATING PROCEDURE AND CHECKLIST
ICP METALS BY METHOD 6010B/200.7

ACTION: If no, evaluate variation with respect to sample matrix, preparation, dilution, moisture, etc. If sample PQL is indeterminate, contact lab for explanation.

3.3 Are results present for each sample in the SDG?

Yes ☒ No ☐ N/A ☐ Comments:

ACTION: If no, check Request for Analysis to verify if method was ordered and COC to verify that it was sent, and contact lab for resubmission of the missing data

3.4 If dilutions were required, were dilution factors reported?

Yes ☒ No ☐ N/A ☐ Comments:

ACTION: If no, contact the lab for submission.

4.0 Method Blanks

4.1 Is the Method Blank Summary present?

Yes ☒ No ☐ N/A ☐ Comments:

ACTION: If no, call the laboratory for submission of missing data.

4.2 Frequency of Analysis: Was a method blank analyzed for each digestion batch of < 20 field samples?

Yes ☒ No ☐ N/A ☐ Comments:

ACTION: If no, contact laboratory for justification. Consult senior chemist for action needed. Narrate non-compliance.

4.3 Is the method blank less than the PQLs for all target elements?

Yes ☐ No ☒ N/A ☐ Comments:

NOTE: MADEP requires the method blank to be matrix matched and digested with the samples

4.4 Do any method blanks have positive results for metals? Qualify data according to the following:

Yes ☒ No ☐ N/A ☐ Comments:



Lab B quals removed

Fe 1.56 mg/kg
All values in
samples much
higher -
No Qual

OLIN CORPORATION
LEVEL I DATA QUALITY EVALUATION – OPTION 1
STANDARD OPERATING PROCEDURE AND CHECKLIST
ICP METALS BY METHOD 6010B/200.7

If the sample concentration is $< 5 \times$ blank value, flag sample result non-detect "U" at the PQL or the concentration reported if greater than the PQL.

If the sample concentration is $> 5 \times$ blank value, no qualification is needed.

ACTION: For any blank with positive results, list all contaminants for each method blank including the concentration detected and the flagging level (flagging level = $5x$ the blank value) and the associated samples and qualifiers.

5.0 Laboratory Control Standard

5.1 Was a laboratory control standard run with each analytical batch of 20 samples or less? Yes ☒ No ☐ N/A ☐ Comments:

NOTE: A full target, second source LCS is required by MADEP.

ACTION: Call laboratory for LCS form submittal. If data are not available, use professional judgement to evaluate data accuracy associated with that batch.

5.2 Is a LCS Summary Form present? Yes ☒ No ☐ N/A ☐ Comments:

ACTION: If no, contact lab for resubmission of missing data.

5.3 Is the recovery of any analyte outside of MADEP control limits? Yes ☐ No ☒ N/A ☐ Comments:

Sample Type	MADEP % Rec
Water	80-120
Soil	within Lab generated limits

ACTION: If recovery is above the upper limit, qualify all positive sample results within the batch as (J). If recovery is below the lower limit, qualify all positive and non-detects results within the batch as (J). If LCS recovery is $< 30\%$, positive and non-detect results are rejected (R).

Comments:

OLIN CORPORATION
LEVEL I DATA QUALITY EVALUATION – OPTION 1
STANDARD OPERATING PROCEDURE AND CHECKLIST
ICP METALS BY METHOD 6010B/200.7

6.0 Matrix Spikes

Matrix spikes may be collected at different frequencies based on monthly, quarterly, or task specific schedules. Confirm spike requirements for each set with the senior chemist.

6.1 Were project-specific MS/MSDs collected? List project samples that were spiked.

Yes ☒ No ☐ N/A ☐ Comments:

ACTION: If no, contact senior chemist to see if any were specified.

6.2 Is the Matrix Spike/Matrix Spike Duplicate Recovery Form present?

Yes ☒ No ☐ N/A ☐ Comments:

NOTE: A full target, second source MS/MSD is required by MADEP.

ACTION: If any matrix spike data are missing, call lab for resubmission.

6.3 Were matrix spikes analyzed as indicated on the COC and project schedule?

Yes ☒ No ☐ N/A ☐ Comments:

ACTION: If any matrix spike data are missing, call lab for resubmission. If none, no qualification is needed. Narrate non-compliance.

6.4 Are any metal spike recoveries outside of the QC limits?

Yes ☒ No ☐ N/A ☐ Comments:

Sample Type	MADEP % Rec	QAPP % Rec	Method
Water	75-125	N/A	6010B
Water	N/A	70-130	200.7
Soil	75-125	75-125	6010B

NOTE: $\%R = \frac{(SSR-SR)}{SA} \times 100\%$

Where: SSR = Spiked sample result
 SR = Sample result
 SA = Spike added

NOTE: If dilutions are required due to high sample concentrations (> 4X spike), the data are evaluated, but no flags are applied.

Al, Fe > 4X spike. No evaluation possible -
 Cr - ok

OLIN CORPORATION
LEVEL I DATA QUALITY EVALUATION – OPTION 1
STANDARD OPERATING PROCEDURE AND CHECKLIST
ICP METALS BY METHOD 6010B/200.7

NOTE: If only one of the recoveries for an MS/MSD pair is outside of the control limits, no qualification is necessary. Use professional judgment for the MS/MSD flags.

ACTION: MS/MSD flags only apply to the sample spiked. If the recoveries of the MS and MSD exceed the upper control limit, qualify positive results as estimated (J). If the recoveries of the MS and MSD are lower than the lower control limit, qualify positive results and non-detects (J).

6.5 Are any RPDs for MS/MSD recoveries outside of the QC limits? Yes ☐ No ☒ N/A ☐ Comments:

NOTE: $RPD = \frac{S-D}{(S+D)/2} \times 100\%$ Where: S = MS sample result
D = MSD sample result

NOTE: If dilutions are required due to high sample concentrations, the data are evaluated, but no flags are applied.

ACTION: If the RPD exceeds the control limit, qualify positive results and non-detects (J).

7.0 Laboratory Duplicate

7.1 Was a laboratory duplicate sample analyzed? If so, is the Laboratory Duplicate Sample Form present? Yes ☐ No ☐ N/A ☒ Comments:

NOTE: MADEP refers to this sample as a "matrix duplicate".

ACTION: If not analyzed, qualification is not needed. If data is missing, contact laboratory for resubmission of report. Narrate non-compliance.

7.2 Is the RPD between the result for the laboratory duplicate sample and the result for the parent sample outside of the QA/QC limits? Yes ☐ No ☐ N/A ☒ Comments:

OLIN CORPORATION
LEVEL I DATA QUALITY EVALUATION – OPTION 1
STANDARD OPERATING PROCEDURE AND CHECKLIST
ICP METALS BY METHOD 6010B/200.7

MADEP Laboratory Duplicate Sample RPD Criteria:

For aqueous results $> 5 \times RL$, RPD must be $\pm 20\%$
For aqueous results $< 5 \times RL$, RPD must be $\leq RL$
For soil/sediment results $> 5 \times RL$, RPD must be $\pm 35\%$
For soil/sediment results $< 5 \times RL$, RPD must be $\leq 2 \times RL$

QAPP RPD

20
20
20
20

ACTION: If the RPD exceeds the limits, qualify both positive results and non-detects as estimated and flag them J. Narrate non-compliance

8.0 Sampling Accuracy

The majority of ground water samples are collected directly from a tap, process stream, or with dedicated tubing. Rinse blanks will not be collected.

8.1 Were rinsate blanks collected? Prior to evaluating rinsate blanks, obtain a list of the associated samples from the senior chemist.

Yes ☐ No ☒ N/A ☐ Comments:

8.2 Do any rinsate blanks have positive results?

Yes ☐ No ☐ N/A ☒ Comments:

NOTE: MADEP does not require the collection of rinsate blanks.

ACTION: Evaluate rinsate results against blank results to determine if contaminant may be laboratory-derived. If results are not lab-related, qualify according to below.

If the sample concentration is $< 5 \times$ blank value, flag sample result non-detect "U" at the PQL or the concentration reported if greater than the PQL.

If the sample concentration is $> 5 \times$ blank value, no qualification is needed.

9.0 Field Duplicates

9.1 Were field duplicate samples collected? Obtain a list of samples and their associated field duplicates.

Yes ☒ No ☐ N/A ☐ Comments:

OLIN CORPORATION
LEVEL I DATA QUALITY EVALUATION – OPTION 1
STANDARD OPERATING PROCEDURE AND CHECKLIST
ICP METALS BY METHOD 6010B/200.7

9.2 Were field duplicates collected per the required frequency?

Yes ☒

No ☐

N/A ☐

Comments:

SOW ☐ QAPP (1 per 10) ☒ MADEP Option 1 (1 per 20) ☐ MADEP Option 3 (1 per 10) ☐

9.3 Was the RPD $\leq 50\%$ for soils or waters? Calculate the RPD for all results and attach to this review.

Yes ☒

No ☐

N/A ☐

Comments:

See attached

ACTION: RPD must be $\leq 50\%$ for soil and water. Qualify data (J) for both sample results if the RPD exceeds 50%.

10.0 Special QA/QC

10.1 Were both total and dissolved metals analysis performed? If so, the dissolved metal concentration should not exceed that of the total metal.

Yes ☐

No ☐

N/A ☒

Comments:

ACTION: If results for both total and dissolved are $\geq 5x$ the PQL **and** the dissolved concentration is 10% higher than the total, flag both results as estimated (J). If total and dissolved concentrations are less than 5x the PQL **and** the **difference** exceeds 2x the PQL, flag both results as estimated (J)

OLIN CORPORATION
LEVEL I DATA QUALITY EVALUATION – OPTION 1
STANDARD OPERATING PROCEDURE AND CHECKLIST
ICP METALS BY METHOD 6010B/200.7

10.0 Application of Validation Qualifiers

Was any of the data qualified?

Yes ☐

No ☒

N/A ☐

Comments:

If so, apply data qualifiers directly to the DQE copy of laboratory report and **flag pages** for entry in database.

REFERENCES

- LAW, 1999, "Final Quality Assurance Project Plan, Olin Wilmington Property, 51 Eames Street, Wilmington, MA", LAW Engineering and Environmental Services, Kennesaw, GA 30144. August 1999
- U.S. Environmental Protection Agency (USEPA), 1989. "Region 1 Laboratory Data Validation Functional Guidelines For Evaluating Inorganic Analyses"; Hazardous Site Evaluation Division; February 1989.
- MADEP, 2001. Massachusetts Department of Environmental Protection Bureau of Waste Site Cleanup, "Massachusetts Quality Assurance and Quality Control (QA/QC) Requirements." BWSC-CAM, Interim Final Draft, Revision No. 2, 5 October 2001.
- MADEP, 2001. Massachusetts Department of Environmental Protection Bureau of Waste Site Cleanup, "Quality Assurance and Quality Control Guidelines for Sampling, Data Evaluation and Reporting Activities," BWSC-CAM, Section VII, Public Comment Draft, Revision No. 0, 21 December 2001.

		Sample		Dup		RPD
OC-SD-SD-SD1-0.0/0.5	Percent Moisture	44		42		5
OC-SD-SD-SD1-0.0/0.5	Percent Solids	56		58		-4
OC-SD-SD-SD1-0.0/0.5	Aluminum	9200		11000		-18
OC-SD-SD-SD1-0.0/0.5	Chromium	21		22		-5
OC-SD-SD-SD1-0.0/0.5	Iron	11000	B	18000	B	-48

ANALYTICAL REPORT

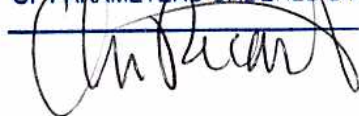
Job Number: 360-25553-1

Job Description: Olin Chemical Superfund Site

For:

Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441
Attention: Mr. Steven Morrow

CHECKED FOR COMPLETENESS
OF PARAMETERS ORDERED BY:



Approved for release.
Joe Chimi
Report Production Representative
11/23/2009 11:12 AM

Designee for
Becky C Mason
Project Manager II
becky.mason@testamericainc.com
11/23/2009

cc: Mr. Peter Thompson

Results relate only to the items tested and the sample(s) as received by the laboratory. The test results in this report meet all NELAC requirements for accredited parameters, exceptions are noted in this report. Pursuant to NELAC, this report may not be reproduced except in full, and with written approval from the laboratory. TestAmerica Westfield Certifications and Approvals: MADEP MA014, RIDOH57, CTDPH 0494, VT DECWSD, NH DES 2539, NELAP FL E87912 TOX, NELAP NJ MA008 TOX, NELAP NY 10843, NY ELAP 10843, North Carolina 647, NELAP PA 68-04386. Field sampling is performed under SOPs WE-FLD-001 and WE-FLD-002.

TestAmerica Laboratories, Inc.

TestAmerica Westfield Westfield Executive Park, 53 Southampton Road, Westfield, MA 01085

Tel (413) 572-4000 Fax (413) 572-3707 www.testamericainc.com



Table of Contents

Cover Title Page	1
Report Narrative	3
Executive Summary	5
Method Summary	7
Method / Analyst Summary	8
Sample Summary	9
Sample Results	10
Sample Datasheets	11
Data Qualifiers	23
QC Results	24
Qc Association Summary	25
Qc Reports	26
Shipping and Receiving Documents	28
Sample Receipt Checklist	29
Client Chain of Custody	30

MADEP MCP Analytical Method Report Certification Form

Laboratory Name: TestAmerica Westfield		Project #: 360-25553-1	
Project Location:		MADEP RTN ¹ :	
This form provides certifications for the following data set:[list Laboratory Sample ID Number(s)] 360-25553-(1-6)			
Sample Matrices:	Groundwater	Soil/Sediment	Drinking Water Other:
MCP SW-846 Methods Used	8260B ()	8151A ()	8330 ()
	8270C ()	8081A ()	VPH ()
	8082 ()	8021B ()	EPH ()
As specified in MADEP Compendium of Analytical Methods. (check all that apply)	1 List Release Tracking Number (RTN), if known 2 M - SW-846 Method 9014 or MADEP Physiologically Available Cyanide (PAC) Method 3 S - SW-846 Methods 7000 Series List individual method and analyte.		

An affirmative response to questions A, B, C and D is required for "Presumptive Certainty" status

A	Were all samples received by the laboratory in a condition consistent with that described on the Chain-of-Custody documentation for the data set?	Yes √	No ¹
B	Were all QA/QC procedures required for the specified analytical method(s) included in this report followed, including the requirement to note and discuss in a narrative QC data that did not meet appropriate performance standards or guidelines?	Yes √	No ¹
C	Does the analytical data included in this report meet all the requirements for "Presumptive Certainty", as described in Section 2.0 (a), (b), (c) and (d) of the MADEP document CAM VII A, " Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?	Yes √	N/A No ¹
D	VPH and EPH methods only: Was the VPH or EPH Method conducted without significant modifications (see Section 11.3 of respective Methods)?	Yes √	N/A No ¹

A response to questions E and F below is required for "Presumptive Certainty" status

E	Were all QC performance standards and recommendations for the specified methods achieved?	Yes	No ¹ √
F	Were results for all analyte-list compounds/elements for the specified method(s) reported?	Yes	N/A No ¹ √

¹ All Negative responses must be addressed in an attached Environmental Laboratory case narrative.

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, accurate and complete.

Signature:



Position: Laboratory Director

Printed Name: Steven C. Hartmann

Date: 11/23/09 11:08

The certification form has been electronically signed and approved.

CAM VII A, Rev 3.2

April-04



MADEP MA014
NY DOH 10843
RI DOH 57
CT DPH 0494
VT DECWSD

NELAP FL E87912 TOX
NELAP NJ MA008 TOX
NELAP NY 10843
NH DES 253901-A



TestAmerica Westfield
53 Southampton Rd,
Westfield, MA 01085
Tel:(413)572-4000
Fax:(413)572-3707

CASE NARRATIVE

Client: Olin Corporation

Project: Olin Chemical Superfund Site

Report Number: 360-25553-1

This case narrative is in the form of an exception report, where only the anomalies related to this report, method specific performance and/or QA/QC issues are discussed. If there are no issues to report, this narrative will include a statement that documents that there are no relevant data issues.

It should be noted that samples with elevated Reporting Limits (RLs) as a result of a dilution may not be able to satisfy customer reporting limits in some cases. Such increases in the RLs are unavoidable but acceptable consequence of sample dilution that enables quantification of target analytes or interferences which exceed the calibration range of the instrument.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT

The samples were received on 11/11/2009; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 5.6 C.

Note: All samples which require thermal preservation are considered acceptable if the arrival temperature is within 2C of the required temperature or method specified range. For samples with a specified temperature of 4C, samples with a temperature ranging from just above freezing temperature of water to 6C shall be acceptable. Samples that are hand delivered immediately following collection may not meet these criteria, however they will be deemed acceptable according to NELAC standards, if there is evidence that the chilling process has begun, such as arrival on ice, etc.

MCP regulatory standard criteria were not specified for this report. Therefore, method reporting limits (RLs) were not assessed against any MCP standards as it may pertain to Question "E" on the Presumptive Certainty Certification Form (MADEP reference: WSC-CAM-AN-093008 - WSC-CAM Analytical Notes).

TOTAL METALS

Samples 360-25553-1 through 360-25553-6 were analyzed for total metals in accordance with EPA SW-846 Method 6010B. The samples were prepared and analyzed on 11/12/2009.

Iron was detected in method blank MB 360-51522/1-A at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged "J". If the associated sample reported a result above the MDL and/or RL, the result has been "B" flagged. Refer to the QC report for details.

Aluminum and Iron failed the recovery criteria low for the MS and MSD of sample 360-25553-6 in batch 360-51594. The presence of the '4' qualifier in the report indicates analytes where the concentration in the unspiked sample exceeded four times the spiking amount. The associated LCS and LCSD recovered within control limits. Refer to the QC report for details.

At the request of the client, an abbreviated/modified MCP analyte list was reported for this job.

No other difficulties were encountered during the metals analyses.

All other quality control parameters were within the acceptance limits.

PERCENT SOLIDS

Samples 360-25553-1 through 360-25553-6 were analyzed for percent solids in accordance with EPA Method 160.3 Modified. The samples were analyzed on 11/12/2009.

No difficulties were encountered during the % solids analyses.

All quality control parameters were within the acceptance limits.

EXECUTIVE SUMMARY - Detections

Client: Olin Corporation

Job Number: 360-25553-1

Lab Sample ID Analyte	Client Sample ID	Result / Qualifier	Reporting Limit	Units	Method
360-25553-1	OC-SD-SD-SD1-0.0/0.5				
Aluminum		9200	5.8	mg/Kg	6010B
Chromium		21	1.2	mg/Kg	6010B
Iron		11000	12	mg/Kg	6010B
Percent Moisture		44	1.0	%	Moisture
Percent Solids		56	1.0	%	Moisture
360-25553-2	OC-SD-SD-SD2-0.0/0.5				
Aluminum		11000	4.7	mg/Kg	6010B
Chromium		77	0.94	mg/Kg	6010B
Iron		17000	9.4	mg/Kg	6010B
Percent Moisture		35	1.0	%	Moisture
Percent Solids		65	1.0	%	Moisture
360-25553-3	OC-SD-SD-SD3-0.0/0.5				
Aluminum		9900	4.7	mg/Kg	6010B
Chromium		20	0.93	mg/Kg	6010B
Iron		14000	9.3	mg/Kg	6010B
Percent Moisture		36	1.0	%	Moisture
Percent Solids		64	1.0	%	Moisture
360-25553-4	OC-SD-SD-SD5-0.0/0.5				
Aluminum		13000	4.0	mg/Kg	6010B
Chromium		320	0.81	mg/Kg	6010B
Iron		18000	8.1	mg/Kg	6010B
Percent Moisture		33	1.0	%	Moisture
Percent Solids		67	1.0	%	Moisture
360-25553-5	OC-SD-SD-SD4-0.0/0.5				
Aluminum		12000	5.0	mg/Kg	6010B
Chromium		25	1.0	mg/Kg	6010B
Iron		15000	10	mg/Kg	6010B
Percent Moisture		41	1.0	%	Moisture
Percent Solids		59	1.0	%	Moisture

EXECUTIVE SUMMARY - Detections

Client: Olin Corporation

Job Number: 360-25553-1

Lab Sample ID Analyte	Client Sample ID	Result / Qualifier	Reporting Limit	Units	Method
360-25553-6	OC-SD-SD-SD1-0.0/0.5 DUP				
Aluminum		11000	4.5	mg/Kg	6010B
Chromium		22	0.90	mg/Kg	6010B
Iron		18000	9.0	mg/Kg	6010B
Percent Moisture		42	1.0	%	Moisture
Percent Solids		58	1.0	%	Moisture

METHOD SUMMARY

Client: Olin Corporation

Job Number: 360-25553-1

Description		Lab Location	Method	Preparation Method
Matrix	Solid			
Metals (ICP)		TAL WFD	SW846 6010B	
Preparation, Metals		TAL WFD		SW846 3050B
Percent Moisture		TAL WFD	EPA Moisture	

Lab References:

TAL WFD = TestAmerica Westfield

Method References:

EPA = US Environmental Protection Agency

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

METHOD / ANALYST SUMMARY

Client: Olin Corporation

Job Number: 360-25553-1

Method	Analyst	Analyst ID
SW846 6010B	Smith, Tim J	TJS
EPA Moisture	Nasiatka, Ellen M	EMN

SAMPLE SUMMARY

Client: Olin Corporation

Job Number: 360-25553-1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
360-25553-1	OC-SD-SD-SD1-0.0/0.5	Solid	11/11/2009 1400	11/11/2009 1715
360-25553-2	OC-SD-SD-SD2-0.0/0.5	Solid	11/11/2009 1425	11/11/2009 1715
360-25553-3	OC-SD-SD-SD3-0.0/0.5	Solid	11/11/2009 1435	11/11/2009 1715
360-25553-4	OC-SD-SD-SD5-0.0/0.5	Solid	11/11/2009 1445	11/11/2009 1715
360-25553-5	OC-SD-SD-SD4-0.0/0.5	Solid	11/11/2009 1500	11/11/2009 1715
360-25553-6	OC-SD-SD-SD1-0.0/0.5 DUP	Solid	11/11/2009 1400	11/11/2009 1715
360-25553-6MS	OC-SD-SD-SD1-0.0/0.5 MS	Solid	11/11/2009 1400	11/11/2009 1715
360-25553-6MSD	OC-SD-SD-SD1-0.0/0.5 MSD	Solid	11/11/2009 1400	11/11/2009 1715

SAMPLE RESULTS

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-25553-1

Client Sample ID: OC-SD-SD-SD1-0.0/0.5
Lab Sample ID: 360-25553-1

Date Sampled: 11/11/2009 1400
Date Received: 11/11/2009 1715
Client Matrix: Solid
Percent Solids: 56

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: 6010B			Date Analyzed:	11/12/2009 1439	
Prep Method: 3050B			Date Prepared:	11/12/2009 0801	
Aluminum	9200	mg/Kg	1.5	5.8	1.0
Chromium	21	mg/Kg	0.15	1.2	1.0
Iron	11000 B	mg/Kg	1.8	12	1.0

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-25553-1

Client Sample ID: OC-SD-SD-SD1-0.0/0.5
Lab Sample ID: 360-25553-1

Date Sampled: 11/11/2009 1400
Date Received: 11/11/2009 1715
Client Matrix: Solid

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: Moisture			Date Analyzed:	11/12/2009 1452	
Percent Moisture	44	%	1.0	1.0	1.0

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-25553-1

Client Sample ID: OC-SD-SD-SD2-0.0/0.5
Lab Sample ID: 360-25553-2

Date Sampled: 11/11/2009 1425
Date Received: 11/11/2009 1715
Client Matrix: Solid
Percent Solids: 66

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: 6010B			Date Analyzed:	11/12/2009 1442	
Prep Method: 3050B			Date Prepared:	11/12/2009 0801	
Aluminum	11000	mg/Kg	1.2	4.7	1.0
Chromium	77	mg/Kg	0.13	0.94	1.0
Iron	17000 B	mg/Kg	1.5	9.4	1.0

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-25553-1

Client Sample ID: OC-SD-SD-SD2-0.0/0.5
Lab Sample ID: 360-25553-2

Date Sampled: 11/11/2009 1425
Date Received: 11/11/2009 1715
Client Matrix: Solid

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: Moisture			Date Analyzed:	11/12/2009 1452	
Percent Moisture	35	%	1.0	1.0	1.0

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-25553-1

Client Sample ID: OC-SD-SD-SD3-0.0/0.5
Lab Sample ID: 360-25553-3

Date Sampled: 11/11/2009 1435
Date Received: 11/11/2009 1715
Client Matrix: Solid
Percent Solids: 64

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: 6010B			Date Analyzed:	11/12/2009 1445	
Prep Method: 3050B			Date Prepared:	11/12/2009 0801	
Aluminum	9900	mg/Kg	1.2	4.7	1.0
Chromium	20	mg/Kg	0.12	0.93	1.0
Iron	14000 B	mg/Kg	1.5	9.3	1.0

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-25553-1

Client Sample ID: OC-SD-SD-SD3-0.0/0.5
Lab Sample ID: 360-25553-3

Date Sampled: 11/11/2009 1435
Date Received: 11/11/2009 1715
Client Matrix: Solid

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: Moisture			Date Analyzed:	11/12/2009 1452	
Percent Moisture	36	%	1.0	1.0	1.0

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-25553-1

Client Sample ID: OC-SD-SD-SD5-0.0/0.5
Lab Sample ID: 360-25553-4

Date Sampled: 11/11/2009 1445
Date Received: 11/11/2009 1715
Client Matrix: Solid
Percent Solids: 67

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: 6010B			Date Analyzed:	11/12/2009 1448	
Prep Method: 3050B			Date Prepared:	11/12/2009 0801	
Aluminum	13000	mg/Kg	1.0	4.0	1.0
Chromium	320	mg/Kg	0.11	0.81	1.0
Iron	18000 B	mg/Kg	1.3	8.1	1.0

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-25553-1

Client Sample ID: OC-SD-SD-SD5-0.0/0.5
Lab Sample ID: 360-25553-4

Date Sampled: 11/11/2009 1445
Date Received: 11/11/2009 1715
Client Matrix: Solid

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: Moisture			Date Analyzed:	11/12/2009 1452	
Percent Moisture	33	%	1.0	1.0	1.0

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-25553-1

Client Sample ID: OC-SD-SD-SD4-0.0/0.5
Lab Sample ID: 360-25553-5

Date Sampled: 11/11/2009 1500
Date Received: 11/11/2009 1715
Client Matrix: Solid
Percent Solids: 59

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: 6010B			Date Analyzed:	11/12/2009 1451	
Prep Method: 3050B			Date Prepared:	11/12/2009 0801	
Aluminum	12000	mg/Kg	1.3	5.0	1.0
Chromium	25	mg/Kg	0.13	1.0	1.0
Iron	15000 B	mg/Kg	1.6	10	1.0

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-25553-1

Client Sample ID: OC-SD-SD-SD4-0.0/0.5
Lab Sample ID: 360-25553-5

Date Sampled: 11/11/2009 1500
Date Received: 11/11/2009 1715
Client Matrix: Solid

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: Moisture			Date Analyzed:	11/12/2009 1452	
Percent Moisture	41	%	1.0	1.0	1.0

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-25553-1

Client Sample ID: OC-SD-SD-SD1-0.0/0.5 DUP
Lab Sample ID: 360-25553-6

Date Sampled: 11/11/2009 1400
Date Received: 11/11/2009 1715
Client Matrix: Solid
Percent Solids: 58

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: 6010B			Date Analyzed:	11/12/2009 1419	
Prep Method: 3050B			Date Prepared:	11/12/2009 0801	
Aluminum	11000	mg/Kg	1.2	4.5	1.0
Chromium	22	mg/Kg	0.12	0.90	1.0
Iron	18000 B	mg/Kg	1.4	9.0	1.0

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-25553-1

Client Sample ID: OC-SD-SD-SD1-0.0/0.5 DUP
Lab Sample ID: 360-25553-6

Date Sampled: 11/11/2009 1400
Date Received: 11/11/2009 1715
Client Matrix: Solid

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: Moisture			Date Analyzed:	11/12/2009 1452	
Percent Moisture	42	%	1.0	1.0	1.0

DATA REPORTING QUALIFIERS

Client: Olin Corporation

Job Number: 360-25553-1

Lab Section	Qualifier	Description
Metals		
	B	Compound was found in the blank and sample.
	4	MS, MSD: The analyte present in the original sample is 4 times greater than the matrix spike concentration; therefore, control limits are not applicable.
	J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

QUALITY CONTROL RESULTS

Quality Control Results

Client: Olin Corporation

Job Number: 360-25553-1

QC Association Summary

Lab Sample ID	Client Sample ID	Report	Client Matrix	Method	Prep Batch
		Basis			
Metals					
Prep Batch: 360-51522					
LCS 360-51522/2-A	Lab Control Sample	T	Solid	3050B	
LCSD 360-51522/3-A	Lab Control Sample Duplicate	T	Solid	3050B	
MB 360-51522/1-A	Method Blank	T	Solid	3050B	
360-25553-1	OC-SD-SD-SD1-0.0/0.5	T	Solid	3050B	
360-25553-2	OC-SD-SD-SD2-0.0/0.5	T	Solid	3050B	
360-25553-3	OC-SD-SD-SD3-0.0/0.5	T	Solid	3050B	
360-25553-4	OC-SD-SD-SD5-0.0/0.5	T	Solid	3050B	
360-25553-5	OC-SD-SD-SD4-0.0/0.5	T	Solid	3050B	
360-25553-6	OC-SD-SD-SD1-0.0/0.5 DUP	T	Solid	3050B	
360-25553-6MS	Matrix Spike	T	Solid	3050B	
360-25553-6MSD	Matrix Spike Duplicate	T	Solid	3050B	
Analysis Batch:360-51594					
LCS 360-51522/2-A	Lab Control Sample	T	Solid	6010B	360-51522
LCSD 360-51522/3-A	Lab Control Sample Duplicate	T	Solid	6010B	360-51522
MB 360-51522/1-A	Method Blank	T	Solid	6010B	360-51522
360-25553-1	OC-SD-SD-SD1-0.0/0.5	T	Solid	6010B	360-51522
360-25553-2	OC-SD-SD-SD2-0.0/0.5	T	Solid	6010B	360-51522
360-25553-3	OC-SD-SD-SD3-0.0/0.5	T	Solid	6010B	360-51522
360-25553-4	OC-SD-SD-SD5-0.0/0.5	T	Solid	6010B	360-51522
360-25553-5	OC-SD-SD-SD4-0.0/0.5	T	Solid	6010B	360-51522
360-25553-6	OC-SD-SD-SD1-0.0/0.5 DUP	T	Solid	6010B	360-51522
360-25553-6MS	Matrix Spike	T	Solid	6010B	360-51522
360-25553-6MSD	Matrix Spike Duplicate	T	Solid	6010B	360-51522

Report Basis

T = Total

General Chemistry

Analysis Batch:360-51576					
360-25553-1	OC-SD-SD-SD1-0.0/0.5	T	Solid	Moisture	
360-25553-2	OC-SD-SD-SD2-0.0/0.5	T	Solid	Moisture	
360-25553-3	OC-SD-SD-SD3-0.0/0.5	T	Solid	Moisture	
360-25553-4	OC-SD-SD-SD5-0.0/0.5	T	Solid	Moisture	
360-25553-5	OC-SD-SD-SD4-0.0/0.5	T	Solid	Moisture	
360-25553-6	OC-SD-SD-SD1-0.0/0.5 DUP	T	Solid	Moisture	
360-25553-6MS	Matrix Spike	T	Solid	Moisture	
360-25553-6MSD	Matrix Spike Duplicate	T	Solid	Moisture	

Report Basis

T = Total

TestAmerica Westfield

Quality Control Results

Client: Olin Corporation

Job Number: 360-25553-1

Method Blank - Batch: 360-51522

Method: 6010B
Preparation: 3050B

Lab Sample ID: MB 360-51522/1-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 11/12/2009 1410
Date Prepared: 11/12/2009 0801

Analysis Batch: 360-51594
Prep Batch: 360-51522
Units: mg/Kg

Instrument ID: Varian 720 ES ICP
Lab File ID: N/A
Initial Weight/Volume: 2.00 g
Final Weight/Volume: 100 mL

Analyte	Result	Qual	MDL	RL
Aluminum	ND		0.65	2.5
Chromium	ND		0.066	0.50
Iron	1.56	J	0.80	5.0

Lab Control Sample/ Lab Control Sample Duplicate Recovery Report - Batch: 360-51522

Method: 6010B
Preparation: 3050B

LCS Lab Sample ID: LCS 360-51522/2-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 11/12/2009 1413
Date Prepared: 11/12/2009 0801

Analysis Batch: 360-51594
Prep Batch: 360-51522
Units: mg/Kg

Instrument ID: Varian 720 ES ICP
Lab File ID: N/A
Initial Weight/Volume: 2.00 g
Final Weight/Volume: 100 mL

LCSD Lab Sample ID: LCSD 360-51522/3-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 11/12/2009 1416
Date Prepared: 11/12/2009 0801

Analysis Batch: 360-51594
Prep Batch: 360-51522
Units: mg/Kg

Instrument ID: Varian 720 ES ICP
Lab File ID: N/A
Initial Weight/Volume: 2.00 g
Final Weight/Volume: 100 mL

Analyte	% Rec.		Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
	LCS	LCSD					
Aluminum	91	90	80 - 120	1	30		
Chromium	92	91	80 - 120	0	30		
Iron	91	90	80 - 120	0	30		

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Olin Corporation

Job Number: 360-25553-1

Matrix Spike/

Matrix Spike Duplicate Recovery Report - Batch: 360-51522

Method: 6010B

Preparation: 3050B

MS Lab Sample ID: 360-25553-6
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 11/12/2009 1422
Date Prepared: 11/12/2009 0801

Analysis Batch: 360-51594
Prep Batch: 360-51522

Instrument ID: Varian 720 ES ICP
Lab File ID: N/A
Initial Weight/Volume: 1.91 g
Final Weight/Volume: 100 mL

MSD Lab Sample ID: 360-25553-6
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 11/12/2009 1425
Date Prepared: 11/12/2009 0801

Analysis Batch: 360-51594
Prep Batch: 360-51522

Instrument ID: Varian 720 ES ICP
Lab File ID: N/A
Initial Weight/Volume: 1.92 g
Final Weight/Volume: 100 mL

Analyte	<u>% Rec.</u>		Limit	RPD	RPD Limit	MS Qual	MSD Qual
	MS	MSD					
Aluminum	-74	-397	75 - 125	14	35	4	4
Chromium	90	88	75 - 125	3	35		
Iron	-1300	-1760	75 - 125	18	35	4	4

Calculations are performed before rounding to avoid round-off errors in calculated results.

State Accreditation Matrix

Method Name	Description	State where Primary Accreditation is Carried				
		New York (NELAC)	Mass	Conn	Florida (NELAC)	North Carolina
821-R-02-012	Toxicity, Acute (48-Hour)(list upon request)				NP	
SM 4500 Cl F	Chlorine, Residual		NP			
SM 9215B	Heterotrophic Plate Count (Pour Plate Method)		P			
SM 9215E	Heterotrophic Plate Count (SimPlate)		P			
SM 9221F	E.Coli (Multiple-Tube Fermentation; EC-MUG)		P			
SM 9222B	Coliforms, Total (Membrane Filter)		P			
SM 9222D	Coliforms, Fecal (Membrane Filter)		P/NP			
SM 9223	Coliforms, Total, and E.Coli (Colilert-P/A)		P			
200.8	Metals (ICP/MS) (list upon request)	NP/P	NP/P	NP/P		
200.7 Rev 4.4	Metals (ICP)(list upon request)	NP/P	NP/P	NP/P		
6010B	Metals (ICP)(list upon request)	NP/SW		NP/SW		
245.1	Mercury (CVAA)	NP/P	NP	NP/P		
7470A	Mercury (CVAA)	NP		NP		
7471A	Mercury (CVAA)	SW		SW		
SM 2340B	Total Hardness (as CaCO3) by calculation	NP/P	NP	NP/P		
3005A	Preparation, Total Recoverable or Dissolved Metals	NP/P		NP/P		
3010A	Preparation, Total Metals	NP/P		NP/P		
3020A	Preparation, Total Metals	NP/P/SW		NP/P/SW		
3050B	Preparation, Metals	SW		SW		
504.1	EDB, DBCP and 1,2,3-TCP (GC)		P	P		
608	Organochlorine Pest/PCBs (list upon request)	NP	NP	NP		
625	Semivolatile Org Comp (GC/MS)(list upon request)	NP		NP		
3546	Microwave Extraction	SW				
3510C	Liquid-Liquid Extraction (Separatory Funnel)	NP		NP		
3540C	Soxhlet Extraction					
3550B	Ultrasonic Extraction	SW		SW		
600/4-81-045	Polychlorinated Biphenyls (PCBs) (GC)		NP	NP		
8081A	Organochlorine Pesticides (GC)(list upon request)	NP/SW		NP/SW		
8082A	PCBs by Gas Chromatography(list upon request)	NP/SW		NP/SW		
8270C	Semivolatile Comp.(GC/MS)(list upon request)	NP/SW		NP/SW		
CT ETPH	Conn - Ext. Total petroleum Hydrocarbons (GC)			NP/SW		
MA-EPH	Mass - Extractable Petroleum Hydrocarbons (GC)			NP/SW		NP/SW
524.2	Volatile Org Comp (GC/MS)(list upon request)	P	P	P		
524.2	Trihalomethanes		P	P		
624	Volatile Org Comp (GC/MS)(list upon request)	NP	NP	NP		
5035	Closed System Purge and Trap	SW		SW		
5030B	Purge and Trap	NP		NP		
8260B	Volatile Org Comp. (GC/MS)(list upon request)	NP/SW		NP/SW		
MAVPH	Mass - Volatile Petroleum Hydrocarbons (GC)			NP/SW		NP/SW
180.1	Turbidity, Nephelometric		P	P		
300	Anions, Ion Chromatography	NP/P	NP/P	NP/P		
410.4	COD	NP	NP	NP		
1010	Ignitability, Pensky-Martens Closed-Cup Method	SW		SW		
10-107-06-2	Nitrogen, Total Kjeldahl	NP	NP	NP		
7196A	Chromium, Hexavalent	NP/SW		NP/SW		
9012A	Cyanide, Total and/or Amenable	NP/SW		NP/SW		
9030B	Sulfide, Distillation (Acid Soluble and Insoluble)	NP		NP		
9040B	pH	NP		NP		
9045C	pH	SW		SW		
L107041C	Nitrogen, Nitrate	NP	P	NP/P		
L107-06-1B	Nitrogen Ammonia	NP	NP	NP/P		
L204001A CN	Cyanide, Total		NP/P	NP/P		
L210-001A	Phenolics, Total Recoverable	NP	NP	NP		
SM 2320B	Alkalinity	NP/P	NP/P	NP/P		
SM 2510B	Conductivity, Specific Conductance	NP/P	NP/P	NP/P		
SM 2540C	Solids, Total Dissolved (TDS)	NP/P	NP/P	NP/P		
SM 2540D	Solids, Total Suspended (TSS)	NP	NP	NP		
SM 3500 CR D	Chromium, Hexavalent	NP		NP		
SM 4500 H+ B	pH	NP/P	NP/P	NP/P		
SM 4500 NO2 B	Nitrogen, Nitrite	NP	P	NP/P		
SM 4500 P E	Phosphorus, Orthophosphate	NP/P	NP	NP/P		
SM 4500 P E	Phosphorus, Total	NP	NP	NP		
SM 4500 S2 D	Sulfide, Total	NP		NP		
SM 5210B	BOD, 5-Day	NP	NP	NP		
SM 5310B	Organic Carbon, Total (TOC)	NP	NP	NP/P		

Not all organic compounds are accredited under NELAC

For methods with multiple compounds all compounds may not meet NELAC criteria, listing should be obtained from the laboratory

The lab carries additional accreditations with several states. This is listing is subject to change based on the laboratories current certification standing.

Login Sample Receipt Check List

Client: Olin Corporation

Job Number: 360-25553-1

Login Number: 25553

List Source: TestAmerica Westfield

Creator: Rinard, Kimberley A

List Number: 1

Question	T / F / NA	Comment
Radioactivity either was not measured or, if measured, is at or below background	N/A	
The cooler's custody seal, if present, is intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	5.6 C
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	N/A	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Is the Field Sampler's name present on COC?	True	
Sample Preservation Verified	True	

Client: Olin Chemical/MACTEC		Project #: 6107-09-0016.04		Job# 360-2553		Quote#		PO#	
Address: 51 Eames Street		Project Manager: P. Thompson		Shaded areas for office use		Analysis Requested		Comments	
Wilmington, MA 01887		Work ID: Sediment		Check analysis and specify method and analytes in comments section.		For example: 500-series for drinking water 600-series for waste water 8000-series for haz/solid waste Use comments section to further define.		MCP case narrative	
Phone: _____ Fax: _____		Contact: David Chapman		Regulatory Classification / Special Report Format		NPDES _____ Drinking Water _____ DEP Form(s) _____			
Requested Turn Around Time		Rush TAT Requested: _____		RCRA _____ MCP GW1/S1 _____ MWRA Smart Rpt _____		MCP QA/QC Rpt XX			
10 Business Day (Std) XX		24 hrs _____ 72 hrs _____		Other _____					
15 Business Day _____		48 hrs _____ 5 Day _____							
Other _____									
Sample Type Codes		DW-Drinking water SW-Surface water		LW-Labwater GW-Groundwater A-Air		S-Solid / Soil SL-Sludge O-Oil Z-Other			
Sample ID		Sample Type		Sample's Initials		Date Time Collected		Comp	
OC-SD-SD-SD1-0.0/0.5		SD		DLC		11/11/09		16	
OC-SD-SD-SD2-0.0/0.5		SD		DLC		14:00		16	
OC-SD-SD-SD3-0.0/0.5		SD		DLC		11/11/09		16	
OC-SD-SD-SD4-0.0/0.5		SD		DLC		14:25		16	
OC-SD-SD-SD5-0.0/0.5		SD		DLC		11/11/09		16	
OC-SD-SD-SD6-0.0/0.5		SD		DLC		14:35		16	
OC-SD-SD-SD7-0.0/0.5		SD		DLC		11/11/09		16	
OC-SD-SD-SD8-0.0/0.5		SD		DLC		14:45		16	
OC-SD-SD-SD9-0.0/0.5		SD		DLC		11/11/09		16	
OC-SD-SD-SD10-0.0/0.5		SD		DLC		15:00		16	
OC-SD-SD-SD11-0.0/0.5		SD		DLC		11/11/09		16	
OC-SD-SD-SD12-0.0/0.5		SD		DLC		14:00		16	
OC-SD-SD-SD13-0.0/0.5		SD		DLC		11/11/09		16	
OC-SD-SD-SD14-0.0/0.5		SD		DLC		14:00		16	
OC-SD-SD-SD15-0.0/0.5		SD		DLC		11/11/09		16	
OC-SD-SD-SD16-0.0/0.5		SD		DLC		14:00		16	
OC-SD-SD-SD17-0.0/0.5		SD		DLC		11/11/09		16	
OC-SD-SD-SD18-0.0/0.5		SD		DLC		14:00		16	
OC-SD-SD-SD19-0.0/0.5		SD		DLC		11/11/09		16	
OC-SD-SD-SD20-0.0/0.5		SD		DLC		14:00		16	
OC-SD-SD-SD21-0.0/0.5		SD		DLC		11/11/09		16	
OC-SD-SD-SD22-0.0/0.5		SD		DLC		14:00		16	
OC-SD-SD-SD23-0.0/0.5		SD		DLC		11/11/09		16	
OC-SD-SD-SD24-0.0/0.5		SD		DLC		14:00		16	
OC-SD-SD-SD25-0.0/0.5		SD		DLC		11/11/09		16	
OC-SD-SD-SD26-0.0/0.5		SD		DLC		14:00		16	
OC-SD-SD-SD27-0.0/0.5		SD		DLC		11/11/09		16	
OC-SD-SD-SD28-0.0/0.5		SD		DLC		14:00		16	
OC-SD-SD-SD29-0.0/0.5		SD		DLC		11/11/09		16	
OC-SD-SD-SD30-0.0/0.5		SD		DLC		14:00		16	
OC-SD-SD-SD31-0.0/0.5		SD		DLC		11/11/09		16	
OC-SD-SD-SD32-0.0/0.5		SD		DLC		14:00		16	
OC-SD-SD-SD33-0.0/0.5		SD		DLC		11/11/09		16	
OC-SD-SD-SD34-0.0/0.5		SD		DLC		14:00		16	
OC-SD-SD-SD35-0.0/0.5		SD		DLC		11/11/09		16	
OC-SD-SD-SD36-0.0/0.5		SD		DLC		14:00		16	
OC-SD-SD-SD37-0.0/0.5		SD		DLC		11/11/09		16	
OC-SD-SD-SD38-0.0/0.5		SD		DLC		14:00		16	
OC-SD-SD-SD39-0.0/0.5		SD		DLC		11/11/09		16	
OC-SD-SD-SD40-0.0/0.5		SD		DLC		14:00		16	
OC-SD-SD-SD41-0.0/0.5		SD		DLC		11/11/09		16	
OC-SD-SD-SD42-0.0/0.5		SD		DLC		14:00		16	
OC-SD-SD-SD43-0.0/0.5		SD		DLC		11/11/09		16	
OC-SD-SD-SD44-0.0/0.5		SD		DLC		14:00		16	
OC-SD-SD-SD45-0.0/0.5		SD		DLC		11/11/09		16	
OC-SD-SD-SD46-0.0/0.5		SD		DLC		14:00		16	
OC-SD-SD-SD47-0.0/0.5		SD		DLC		11/11/09		16	
OC-SD-SD-SD48-0.0/0.5		SD		DLC		14:00		16	
OC-SD-SD-SD49-0.0/0.5		SD		DLC		11/11/09		16	
OC-SD-SD-SD50-0.0/0.5		SD		DLC		14:00		16	
OC-SD-SD-SD51-0.0/0.5		SD		DLC		11/11/09		16	
OC-SD-SD-SD52-0.0/0.5		SD		DLC		14:00		16	
OC-SD-SD-SD53-0.0/0.5		SD		DLC		11/11/09		16	
OC-SD-SD-SD54-0.0/0.5		SD		DLC		14:00		16	
OC-SD-SD-SD55-0.0/0.5		SD		DLC		11/11/09		16	
OC-SD-SD-SD56-0.0/0.5		SD		DLC		14:00		16	
OC-SD-SD-SD57-0.0/0.5		SD		DLC		11/11/09		16	
OC-SD-SD-SD58-0.0/0.5		SD		DLC		14:00		16	
OC-SD-SD-SD59-0.0/0.5		SD		DLC		11/11/09		16	
OC-SD-SD-SD60-0.0/0.5		SD		DLC		14:00		16	
OC-SD-SD-SD61-0.0/0.5		SD		DLC		11/11/09		16	
OC-SD-SD-SD62-0.0/0.5		SD		DLC		14:00		16	
OC-SD-SD-SD63-0.0/0.5		SD		DLC		11/11/09		16	
OC-SD-SD-SD64-0.0/0.5		SD		DLC		14:00		16	
OC-SD-SD-SD65-0.0/0.5		SD		DLC		11/11/09		16	
OC-SD-SD-SD66-0.0/0.5		SD		DLC		14:00		16	
OC-SD-SD-SD67-0.0/0.5		SD		DLC		11/11/09		16	
OC-SD-SD-SD68-0.0/0.5		SD		DLC		14:00		16	
OC-SD-SD-SD69-0.0/0.5		SD		DLC		11/11/09		16	
OC-SD-SD-SD70-0.0/0.5		SD		DLC		14:00		16	
OC-SD-SD-SD71-0.0/0.5		SD		DLC		11/11/09		16	
OC-SD-SD-SD72-0.0/0.5		SD		DLC		14:00		16	
OC-SD-SD-SD73-0.0/0.5		SD		DLC		11/11/09		16	
OC-SD-SD-SD74-0.0/0.5		SD		DLC		14:00		16	
OC-SD-SD-SD75-0.0/0.5		SD		DLC		11/11/09		16	
OC-SD-SD-SD76-0.0/0.5		SD		DLC		14:00		16	
OC-SD-SD-SD77-0.0/0.5		SD		DLC		11/11/09		16	
OC-SD-SD-SD78-0.0/0.5		SD		DLC		14:00		16	
OC-SD-SD-SD79-0.0/0.5		SD		DLC		11/11/09		16	
OC-SD-SD-SD80-0.0/0.5		SD		DLC		14:00		16	
OC-SD-SD-SD81-0.0/0.5		SD		DLC		11/11/09		16	
OC-SD-SD-SD82-0.0/0.5		SD		DLC		14:00		16	
OC-SD-SD-SD83-0.0/0.5		SD		DLC		11/11/09		16	
OC-SD-SD-SD84-0.0/0.5		SD		DLC		14:00		16	
OC-SD-SD-SD85-0.0/0.5		SD		DLC		11/11/09		16	
OC-SD-SD-SD86-0.0/0.5		SD		DLC		14:00		16	
OC-SD-SD-SD87-0.0/0.5		SD		DLC		11/11/09		16	
OC-SD-SD-SD88-0.0/0.5		SD		DLC		14:00		16	
OC-SD-SD-SD89-0.0/0.5		SD		DLC		11/11/09		16	
OC-SD-SD-SD90-0.0/0.5		SD		DLC		14:00		16	
OC-SD-SD-SD91-0.0/0.5		SD		DLC		11/11/09		16	
OC-SD-SD-SD92-0.0/0.5		SD		DLC		14:00		16	
OC-SD-SD-SD93-0.0/0.5		SD		DLC		11/11/09		16	
OC-SD-SD-SD94-0.0/0.5		SD		DLC		14:00		16	
OC-SD-SD-SD95-0.0/0.5		SD		DLC		11/11/09		16	
OC-SD-SD-SD96-0.0/0.5		SD		DLC		14:00		16	
OC-SD-SD-SD97-0.0/0.5		SD		DLC		11/11/09		16	
OC-SD-SD-SD98-0.0/0.5		SD		DLC		14:00		16	
OC-SD-SD-SD99-0.0/0.5		SD		DLC		11/11/09		16	
OC-SD-SD-SD100-0.0/0.5		SD		DLC		14:00		16	
OC-SD-SD-SD101-0.0/0.5		SD		DLC		11/11/09		16	
OC-SD-SD-SD102-0.0/0.5		SD		DLC		14:00		16	
OC-SD-SD-SD103-0.0/0.5		SD		DLC		11/11/09		16	
OC-SD-SD-SD104-0.0/0.5		SD		DLC		14:00		16	
OC-SD-SD-SD105-0.0/0.5		SD		DLC		11/11/09		16	
OC-SD-SD-SD106-0.0/0.5		SD		DLC		14:00		16	
OC-SD-SD-SD107-0.0/0.5		SD		DLC		11/11/09		16	
OC-SD-SD-SD108-0.0/0.5		SD		DLC		14:00		16	
OC-SD-SD-SD109-0.0/0.5		SD		DLC		11/11/09		16	
OC-SD-SD-SD110-0.0/0.5		SD		DLC		14:00		16	
OC-SD-SD-SD111-0.0/0.5		SD		DLC		11/11/09		16	
OC-SD-SD-SD112-0.0/0.5		SD		DLC		14:00		16	
OC-SD-SD-SD113-0.0/0.5		SD		DLC		11/11/09		16	
OC-SD-SD-SD114-0.0/0.5		SD		DLC		14:00		16	
OC-SD-SD-SD115-0.0/0.5		SD		DLC		11/11/09		16	
OC-SD-SD-SD116-0.0/0.5		SD		DLC		14:00		16	
OC-SD-SD-SD117-0.0/0.5		SD		DLC		11/11/09		16	
OC-SD-SD-SD118-0.0/0.5		SD		DLC		14:00		16	
OC-SD-SD-SD119-0.0/0.5		SD		DLC		11/11/09		16	
OC-SD-SD-SD120-0.0/0.5		SD		DLC		14:00		16	
OC-SD-SD-SD121-0.0/0.5		SD		DLC		11/11/09		16	
OC-SD-SD-SD122-0.0/0.5		SD		DLC		14:00		16	
OC-SD-SD-SD123-0.0/0.5		SD		DLC		11/11/09		16	
OC-SD-SD-SD124-0.0/0.5		SD		DLC		14:00		16	
OC-SD-SD-SD125-0.0/0.5		SD		DLC		11/11/09		16	
OC-SD-SD-SD126-0.0/0.5		SD		DLC		14:00		16	
OC-SD-SD-SD127-0.0/0.5		SD		DLC		11/11/09		16	
OC-SD-SD-SD128-0.0/0.5		SD		DLC		14:00		16	
OC-SD-SD-SD129-0.0/0.5		SD		DLC		11/11/09		16	
OC-SD-SD-SD130-0.0/0.5		SD		DLC		14:00		16	
OC-SD-SD-SD131-0.0/0.5		SD		DLC		11/11/09		16	
OC-SD-SD-SD132-0.0/0.5		SD		DLC		14:00		16	
OC-SD-SD-SD133-0.0/0.5		SD		DLC		11/11/09		16	
OC-SD-SD-SD134-0.0/0.5		SD		DLC		14:00		16	
OC-SD-SD-SD135-0.0/0.5		SD		DLC		11/11/09		16	
OC-SD-SD-SD136-0.0/0.5		SD		DLC		14:00		16	
OC-SD-SD-SD137-0.0/0.5		SD		DLC		11/11/09		16	
OC-SD-SD-SD138-0.0/0.5		SD		DLC		14:00		16	
OC-SD-SD-SD139-0.0/0.5		SD		DLC		11/11/09		16	
OC-SD-SD-SD140-0.0/0.5		SD		DLC		14:00		16	
OC-SD-SD-SD141-0.0/0.5		SD		DLC		11/11/09		16	
OC-SD-SD-SD142-0.0/0.5		SD		DLC		14:00		16	
OC-SD-SD-SD143-0.0/0.5		SD		DLC		11/11/09		16	
OC-SD-SD-SD144-0.0/0.5		SD		DLC		14:00		16	
OC-SD-SD-SD145-0.0/0.5		SD		DLC		11/11/09		16	
OC-SD-SD-SD146-0.0/0.5		SD		DLC		14:00		16	
OC-SD-SD-SD147-0.0/0.5		SD		DLC		11/11/09		16	
OC-SD-SD-SD148-0.0/0.5		SD		DLC		14:00		16	
OC-SD-SD-SD149-0.0/0.5		SD		DLC		11/11/09		16	
OC-SD-SD-SD150-0.0/0.5		SD		DLC		14:00		16	
OC-SD-SD-SD151-0.0/0.5		SD		DLC		11/11/09		16	
OC-SD-SD-SD152-0.0/0.5		SD		DLC		14:00		16	
OC-SD-SD-SD153-0.0/0.5		SD		DLC		11/11/09		16	
OC-SD-SD-SD154-0.0/0.5		SD		DLC		14:00		16	
OC-SD-SD-SD155-0.0/0.5		SD		DLC		11/11/09		16	
OC-SD-SD-SD156-0.0/0.5		SD		DLC		14:00		16	
OC-SD-SD-SD157-0.0/0.5		SD		DLC		11/11/09		16	
OC-SD-SD-SD158-0.0/0.5		SD		DLC		14:00		16	
OC-SD									

OLIN-WILMINGTON
LEVEL I DATA QUALITY EVALUATION
STANDARD OPERATING PROCEDURE AND CHECKLIST
ICP METALS BY METHOD 6010B/2007

Total/Dissolved Al, Cr, Na

Reviewer/Date Chris Ricciardi 3/18/10
Sr. Review/Date _____
Lab Report # 25577
Project # 0107100014

1.0 Laboratory Deliverable Requirements

1.1 Laboratory Information: Was all of the following provided in the laboratory report? Yes ☒ No ☐ N/A ☐ Comments:
Check items received.

☒ Name of Laboratory ☒ Address ☒ Project ID ☒ Phone # ☒ Sample identification – Field and Laboratory
Client Information: ☒ Name ☒ Address ☒ Client Contact (IDs must be cross-referenced)

ACTION: If no, contact lab for submission of missing or illegible information.

1.2 Laboratory Report Certification Statement

Yes ☒ No ☐ N/A ☐ Comments:

Does the laboratory report include a completed Analytical Report Certification in the required format?

ACTION: If no, contact lab for submission of missing certification or certification with correct format.

1.3 Laboratory Case Narrative:

Yes ☒ No ☐ N/A ☐ Comments:

☐ Narrative serves as an exception report for the project and method QA/QC performance. ☒ Narrative includes an explanation of each discrepancy on the

Certification Statement.

ACTION: If no, contact lab for submission of missing or illegible information.

1.4 Chain of Custody (COC) copy present with all documentation completed

Yes ☒ No ☐ N/A ☐ Comments:

NOTE: Olin receives and maintains the *original* COC.

ACTION: If no, contact lab for submission of copy of completed COC.

OLIN CORPORATION
LEVEL I DATA QUALITY EVALUATION – OPTION 1
STANDARD OPERATING PROCEDURE AND CHECKLIST
ICP METALS BY METHOD 6010B/200.7

1.5 Sample Receipt Information (Cooler Receipt Form present?):

Yes ☒ No ☐ N/A ☐ Comments:

Were each of the following tasks completed and recorded upon receipt of the sample(s) into the laboratory?

- ☒ Sample temperature confirmed: must be 1° – 10° C. (If samples were sent by courier and delivered on the same day as collection, temperature requirement does not apply).
☒ Container type noted ☒ sample condition observed ☒ pH verified (where applicable) ☒ Field and lab IDs cross referenced

ACTION: If no, contact lab for submission of missing or incomplete documentation.

1.5.1 Were all samples delivered to the laboratory without breakage?

Yes ☒ No ☐ N/A ☐ Comments:

1.5.2 Does the *Cooler Receipt Form* or Lab Narrative indicate other problems with sample receipt, condition of the samples, analytical problems or special circumstances affecting the quality of the data?

Yes ☐ No ☒ N/A ☐ Comments:

1.6 Sample Results Section: Was each of the following requirements supplied in the laboratory report for each sample?

Yes ☐ No ☐ N/A ☐ Comments:

- ☒ Field ID and Lab ID ☒ Date and time collected ☒ Analyst Initials ☒ Dilution Factor ☒ % moisture or solids ☒ Reporting limits
☒ Clean-up method ☒ Analysis method ☒ Preparation method ☒ Date of preparation/extraction/digestion clean-up and analysis, where applicable
☒ Matrix ☒ Target analytes and concentrations ☒ Units (soils must be reported in dry weight)

ACTION: If no, contact lab for submission of missing or incomplete information.

1.7 QA/QC Information: Was each of the following information supplied in the laboratory report for each sample batch?

Yes ☒ No ☐ N/A ☐ Comments:

OLIN CORPORATION
LEVEL I DATA QUALITY EVALUATION – OPTION 1
STANDARD OPERATING PROCEDURE AND CHECKLIST
ICP METALS BY METHOD 6010B/200.7

☒ Method blank results ☒ LCS recoveries ☒ MS/MSD recoveries and RPDs ☐ Laboratory duplicate results (where applicable)

ACTION: If no, contact lab for submission of missing or incomplete information.

See LCS D, MSD

2.0 Holding Times

Have any technical holding times, determined from date of collection to date of analysis, been exceeded? Holding time for metals is 180 days from sample collection to analysis for both water and soil. Yes ☐ No ☒ N/A ☐ Comments:

NOTE: List samples that exceed hold time with # of days exceeded on checklist

ACTION: If technical holding times are exceeded, qualify all positive results (J) and non-detects (UJ). If grossly exceeded (2X holding time) reject (R) all non-detect results.

3.0 Laboratory Method

3.1 Was the correct laboratory method used? Yes ☒ No ☐ N/A ☐ Comments:

Water Digestion	3005A or 3010A or 3020A
Soil Digestion	3050B
Metals	6010B or 200.7

ACTION: If no, contact laboratory to provide justification for method change compared to the requested method. Contact senior chemist to inform Client of change and to request variance.

3.2 Are the practical quantitation limits the same as those specified by the Yes ☒ No ☐ N/A ☐ Comments:
☐ SOW ☒ QAPP ☐ Lab ☐ MADEP

NOTE: Verify that the reported metals match the target list specified on the COC.

OLIN CORPORATION
LEVEL I DATA QUALITY EVALUATION – OPTION 1
STANDARD OPERATING PROCEDURE AND CHECKLIST
ICP METALS BY METHOD 6010B/200.7

ACTION: If no, evaluate variation with respect to sample matrix, preparation, dilution, moisture, etc. If sample PQL is indeterminate, contact lab for explanation.

3.3 Are results present for each sample in the SDG?

Yes ☒ No ☐ N/A ☐ Comments:

ACTION: If no, check Request for Analysis to verify if method was ordered and COC to verify that it was sent, and contact lab for resubmission of the missing data

3.4 If dilutions were required, were dilution factors reported?

Yes ☒ No ☐ N/A ☐ Comments:

ACTION: If no, contact the lab for submission.

4.0 Method Blanks

4.1 Is the Method Blank Summary present?

Yes ☒ No ☐ N/A ☐ Comments:

ACTION: If no, call the laboratory for submission of missing data.

4.2 Frequency of Analysis: Was a method blank analyzed for each digestion batch of < 20 field samples?

Yes ☒ No ☐ N/A ☐ Comments:

ACTION: If no, contact laboratory for justification. Consult senior chemist for action needed. Narrate non-compliance.

4.3 Is the method blank less than the PQLs for all target elements?

Yes ☒ No ☐ N/A ☐ Comments:

NOTE: MADEP requires the method blank to be matrix matched and digested with the samples

4.4 Do any method blanks have positive results for metals? Qualify data according to the following:

Yes ☐ No ☒ N/A ☐ Comments:

OLIN CORPORATION
LEVEL I DATA QUALITY EVALUATION – OPTION 1
STANDARD OPERATING PROCEDURE AND CHECKLIST
ICP METALS BY METHOD 6010B/200.7

If the sample concentration is $< 5 \times$ blank value, flag sample result non-detect "U" at the PQL or the concentration reported if greater than the PQL.

If the sample concentration is $> 5 \times$ blank value, no qualification is needed.

ACTION: For any blank with positive results, list all contaminants for each method blank including the concentration detected and the flagging level (flagging level = $5 \times$ the blank value) and the associated samples and qualifiers.

5.0 Laboratory Control Standard

5.1 Was a laboratory control standard run with each analytical batch of 20 samples or less? Yes ☒ No ☐ N/A ☐ Comments:

NOTE: A full target, second source LCS is required by MADEP.

ACTION: Call laboratory for LCS form submittal. If data are not available, use professional judgement to evaluate data accuracy associated with that batch.

5.2 Is a LCS Summary Form present? Yes ☒ No ☐ N/A ☐ Comments:

ACTION: If no, contact lab for resubmission of missing data.

5.3 Is the recovery of any analyte outside of MADEP control limits? Yes ☐ No ☒ N/A ☐ Comments:

Sample Type	MADEP % Rec
Water	80-120
Soil	within Lab generated limits

ACTION: If recovery is above the upper limit, qualify all positive sample results within the batch as (J). If recovery is below the lower limit, qualify all positive and non-detects results within the batch as (J). If LCS recovery is $< 30\%$, positive and non-detect results are rejected (R).

Comments:

OLIN CORPORATION
LEVEL I DATA QUALITY EVALUATION – OPTION 1
STANDARD OPERATING PROCEDURE AND CHECKLIST
ICP METALS BY METHOD 6010B/200.7

6.0 Matrix Spikes

Matrix spikes may be collected at different frequencies based on monthly, quarterly, or task specific schedules. Confirm spike requirements for each set with the senior chemist.

6.1 Were project-specific MS/MSDs collected? List project samples that were spiked. Yes ☒ No ☐ N/A ☐ Comments:

ACTION: If no, contact senior chemist to see if any were specified.

6.2 Is the Matrix Spike/Matrix Spike Duplicate Recovery Form present? Yes ☒ No ☐ N/A ☐ Comments:

NOTE: A full target, second source MS/MSD is required by MADEP.

ACTION: If any matrix spike data are missing, call lab for resubmission.

6.3 Were matrix spikes analyzed as indicated on the COC and project schedule? Yes ☒ No ☐ N/A ☐ Comments:

ACTION: If any matrix spike data are missing, call lab for resubmission. If none, no qualification is needed. Narrate non-compliance.

6.4 Are any metal spike recoveries outside of the QC limits? Yes ☐ No ☒ N/A ☐ Comments:

Sample Type	MADEP % Rec	QAPP % Rec	Method
Water	75-125	N/A	6010B
Water	N/A	70-130	200.7
Soil	75-125	75-125	6010B

NOTE: $\%R = \frac{(SSR-SR)}{SA} \times 100\%$

Where: SSR = Spiked sample result
SR = Sample result
SA = Spike added

NOTE: If dilutions are required due to high sample concentrations (> 4X spike), the data are evaluated, but no flags are applied.

2635-6 Total/Dissolved
OC-SW-18R

OLIN CORPORATION
LEVEL I DATA QUALITY EVALUATION – OPTION 1
STANDARD OPERATING PROCEDURE AND CHECKLIST
ICP METALS BY METHOD 6010B/200.7

NOTE: If only one of the recoveries for an MS/MSD pair is outside of the control limits, no qualification is necessary. Use professional judgment for the MS/MSD flags.

ACTION: MS/MSD flags only apply to the sample spiked. If the recoveries of the MS and MSD exceed the upper control limit, qualify positive results as estimated (J). If the recoveries of the MS and MSD are lower than the lower control limit, qualify positive results and non-detects (J).

6.5 Are any RPDs for MS/MSD recoveries outside of the QC limits?

Yes ☐ No ☒ N/A ☐ Comments:

NOTE: $RPD = \frac{S-D}{(S+D)/2} \times 100\%$

Where: S = MS sample result
D = MSD sample result

NOTE: If dilutions are required due to high sample concentrations, the data are evaluated, but no flags are applied.

ACTION: If the RPD exceeds the control limit, qualify positive results and non-detects (J).

7.0 Laboratory Duplicate

7.1 Was a laboratory duplicate sample analyzed? If so, is the Laboratory Duplicate Sample Form present? Yes ☐ No ☐ N/A ☒ Comments:

NOTE: MADEP refers to this sample as a "matrix duplicate".

ACTION: If not analyzed, qualification is not needed. If data is missing, contact laboratory for resubmission of report. Narrate non-compliance.

7.2 Is the RPD between the result for the laboratory duplicate sample and the result for the parent sample outside of the QA/QC limits?

Yes ☐ No ☐ N/A ☒ Comments:

OLIN CORPORATION
LEVEL I DATA QUALITY EVALUATION – OPTION 1
STANDARD OPERATING PROCEDURE AND CHECKLIST
ICP METALS BY METHOD 6010B/200.7

MADEP Laboratory Duplicate Sample RPD Criteria:

For aqueous results $> 5 \times RL$, RPD must be $\pm 20\%$
For aqueous results $< 5 \times RL$, RPD must be $\leq RL$
For soil/sediment results $> 5 \times RL$, RPD must be $\pm 35\%$
For soil/sediment results $< 5 \times RL$, RPD must be $\leq 2 \times RL$

QAPP RPD

20
20
20
20

ACTION: If the RPD exceeds the limits, qualify both positive results and non-detects as estimated and flag them J. Narrate non-compliance

8.0 Sampling Accuracy

The majority of ground water samples are collected directly from a tap, process stream, or with dedicated tubing. Rinse blanks will not be collected.

8.1 Were rinsate blanks collected? Prior to evaluating rinsate blanks, obtain a list of the associated samples from the senior chemist.

Yes ☐ No ☒ N/A ☐ Comments:

8.2 Do any rinsate blanks have positive results?

Yes ☐ No ☐ N/A ☒ Comments:

NOTE: MADEP does not require the collection of rinsate blanks.

ACTION: Evaluate rinsate results against blank results to determine if contaminant may be laboratory-derived. If results are not lab-related, qualify according to below.

If the sample concentration is $< 5 \times$ blank value, flag sample result non-detect "U" at the PQL or the concentration reported if greater than the PQL.

If the sample concentration is $> 5 \times$ blank value, no qualification is needed.

9.0 Field Duplicates

9.1 Were field duplicate samples collected? Obtain a list of samples and their associated field duplicates.

Yes ☒ No ☐ N/A ☐ Comments:

SW-18R + Dup

OLIN CORPORATION
LEVEL I DATA QUALITY EVALUATION – OPTION 1
STANDARD OPERATING PROCEDURE AND CHECKLIST
ICP METALS BY METHOD 6010B/200.7

9.2 Were field duplicates collected per the required frequency?

Yes ☒ No ☐ N/A ☐ Comments:

SOW ☐ QAPP (1 per 10) ☒ MADEP Option 1 (1 per 20) ☐ MADEP Option 3 (1 per 10) ☐

9.3 Was the RPD $\leq 50\%$ for soils or waters? Calculate the RPD for all results and attach to this review. Yes ☒ No ☐ N/A ☐ Comments:

ACTION: RPD must be $\leq 50\%$ for soil and water. Qualify data (J) for both sample results if the RPD exceeds 50%.

10.0 Special QA/QC

10.1 Were both total and dissolved metals analysis performed? If so, the dissolved metal concentration should not exceed that of the total metal. Yes ☒ No ☐ N/A ☐ Comments:

ACTION: If results for both total and dissolved are $\geq 5x$ the PQL **and** the dissolved concentration is 10% higher than the total, flag both results as estimated (J). If total and dissolved concentrations are less than 5x the PQL **and** the **difference** exceeds 2x the PQL, flag both results as estimated (J)

Dis. Sodium high in subset of samples. Both results J

**OLIN CORPORATION
LEVEL I DATA QUALITY EVALUATION – OPTION 1
STANDARD OPERATING PROCEDURE AND CHECKLIST
ICP METALS BY METHOD 6010B/200.7**

10.0 Application of Validation Qualifiers

Was any of the data qualified?

Yes ☒ No ☐ N/A ☐ Comments:

If so, apply data qualifiers directly to the DQE copy of laboratory report and **flag pages** for entry in database.

REFERENCES

- LAW, 1999, "Final Quality Assurance Project Plan, Olin Wilmington Property, 51 Eames Street, Wilmington, MA", LAW Engineering and Environmental Services, Kennesaw, GA 30144. August 1999
- U.S. Environmental Protection Agency (USEPA), 1989. "Region 1 Laboratory Data Validation Functional Guidelines For Evaluating Inorganic Analyses"; Hazardous Site Evaluation Division; February 1989.
- MADEP, 2001. Massachusetts Department of Environmental Protection Bureau of Waste Site Cleanup, "Massachusetts Quality Assurance and Quality Control (QA/QC) Requirements." BWSC-CAM, Interim Final Draft, Revision No. 2, 5 October 2001.
- MADEP, 2001. Massachusetts Department of Environmental Protection Bureau of Waste Site Cleanup, "Quality Assurance and Quality Control Guidelines for Sampling, Data Evaluation and Reporting Activities," BWSC-CAM, Section VII, Public Comment Draft, Revision No. 0, 21 December 2001.

OLIN-WILMINGTON
LEVEL I DATA QUALITY EVALUATION
STANDARD OPERATING PROCEDURE AND CHECKLIST
WET CHEMISTRY PARAMETERS BY VARIOUS METHODS
Cl, SO₄, NO₂/NO₃, NH₃, Cond.

Reviewer/Date *Chris Riccio 3/18/10*
 Sr. Review/Date _____
 Lab Report # *25577*
 Project # *010720001b*

Note: The following analyses will be evaluated according to the "MADEP QA/QC Guidelines for Sampling, Data Evaluation and Reporting Activities." MADEP, however, may not list QA/QC criteria for every chemical analysis. Where not defined by MADEP, criteria will default to values stipulated in the QAPP. Where the QAPP does not define criteria, QA/QC requirements will default to limits employed by the laboratory.

1.0 Laboratory Deliverable Requirements

1.1 Laboratory Information: Was all of the following provided in the laboratory report? Yes ☒ No ☐ N/A ☐ Comments:

Check items received.

☒ Name of Laboratory ☒ Address ☒ Project ID ☒ Phone # ☒ Sample identification – Field and Laboratory
 Client Information: ☒ Name ☒ Address ☒ Client Contact (IDs must be cross-referenced)

ACTION: If no, contact lab for submission of missing or illegible information.

1.2 Laboratory Report Certification Statement

Yes ☒ No ☐ N/A ☐ Comments:

Does the laboratory report include a completed Analytical Report Certification in the required format?

ACTION: If no, contact lab for submission of missing certification or certification with correct format.

1.3 Laboratory Case Narrative:

Yes ☒ No ☐ N/A ☐ Comments:

☐ Narrative serves as an exception report for the project and method QA/QC performance. ☒ Narrative includes an explanation of each discrepancy on the Certification Statement.

ACTION: If no, contact lab for submission of missing or illegible information.

1.4 Chain of Custody (COC) copy present with all documentation completed?

Yes ☒ No ☐ N/A ☐ Comments:

Does the laboratory report include copies of Chain of Custody forms containing all samples in this SDG?

NOTE: Olin receives and maintains the *original* COC.

ACTION: If no, contact lab for submission of copy of missing completed COC.

1.5 Sample Receipt Information (Cooler Receipt Form): Were each of the following tasks completed and recorded upon receipt of the sample(s) into the laboratory?

OLIN-WILMINGTON
LEVEL I DATA QUALITY EVALUATION
STANDARD OPERATING PROCEDURE AND CHECKLIST
WET CHEMISTRY PARAMETERS BY VARIOUS METHODS

Yes ☒ No ☐ N/A ☐ Comments:

- ☒ Sample temperature confirmed: must be 1° – 10° C. (If samples were sent by courier and delivered on the same day as collection, temperature requirement does not apply).
- ☒ Container type noted ☒ Condition observed ☒ pH verified (where applicable) ☒ Field and lab IDs cross referenced

ACTION: If no, contact lab for submission of missing or incomplete documentation.

1.5.1 Were the correct bottles and preservatives used?

Yes ☒ No ☐ N/A ☐ Comments:

Ammonia, – 1 Liter polyethylene/H₂SO₄ to pH<2, cool to 4°C

Oil & Grease – 1 Liter glass/HCL or H₂SO₄ to pH<2, cool to 4°C

Alkalinity – 1 Liter polyethylene/cool to 4°C

Chemical Oxygen Demand – 50 mL polyethylene/H₂SO₄ to pH<2, cool to 4°C

Chloride, pH, sulfate, nitrate, nitrite - 50 mL polyethylene/cool to 4°C

Nitrate/nitrite - H₂SO₄ to pH<2, cool to 4°C

Organic Carbon – 500 mL amber glass bottle/HCL or H₂SO₄ to pH<2, cool to 4°C

Sulfide – 50 mL polyethylene/ZnAcetate + NaOH to pH>9, cool to 4°C

Phenolics - H₂SO₄ to pH<2, cool to 4°C

Specific conductance, TDS, TSS – 100 mL polyethylene/cool to 4°C

ACTION: If no, inform senior chemist. Document justification for change in container/volume (if applicable), qualify positive and non-detect data (J) data if cooler temperature exceeds 10°C. Rejection of data requires professional judgment

1.5.2 Were all samples delivered to the laboratory without breakage?

Yes ☒ No ☐ N/A ☐ Comments:

1.5.3 Does the *Cooler Receipt Form* or Lab Narrative indicate other problems with sample receipt, condition of the samples, analytical problems or special circumstances affecting the quality of the data?

Yes ☐ No ☒ N/A ☐ Comments:

OLIN-WILMINGTON
LEVEL I DATA QUALITY EVALUATION
STANDARD OPERATING PROCEDURE AND CHECKLIST
WET CHEMISTRY PARAMETERS BY VARIOUS METHODS

1.6 Sample Results Section: Was the following information supplied in the laboratory report for each sample?

Yes ☒ No ☐ N/A ☐ Comments:

☒ Field ID and Lab ID

☒ Date and time collected

☒ Analyst Initials

☒ Dilution Factor

☒ % moisture or solids

☒ Reporting limits

☒ Clean-up method

☒ Analysis method

☒ Preparation method

☒ Date of preparation/extraction/digestion clean-up and analysis, where applicable

☒ Matrix

☒ Target analytes and concentrations

☒ Units (soils must be reported in dry weight)

ACTION: If no, contact lab for submission of missing or incomplete information.

1.7 QA/QC Information: Was the following information provided in the laboratory report for each sample batch? Yes ☒ No ☐ N/A ☐ Comments:

☒ Method blank results

☒ LCS recoveries

☒ MS/MSD recoveries and RPDs

☒ Laboratory duplicate results (where applicable)

ACTION: If no, contact lab for submission of missing or incomplete information.

2.0 Holding Times

Yes ☐ No ☒ N/A ☐ Comments:

Have any technical holding times, determined from date of collection to date of analysis, been exceeded? The holding times are as follows:

28 days = ammonia, chemical oxygen demand, chloride, organic carbon, oil & grease, specific conductance, total organic carbon and sulfate

Alkalinity = 14 days

Sulfide, TDS, TSS = 7 days

pH = analyze immediately

Nitrate nitrogen as N = 48 hrs

Nitrite nitrogen as N = 48 hrs

Nitrate + Nitrite as N = 28 days

NOTE: List samples that exceed hold time with # of days exceeded on checklist

ACTION: If technical holding times are exceeded qualify results (J). For water samples that are grossly exceeded (>2X hold time) reject (R) all non-detect results. Professional judgment used to qualify soils.

3.0 Laboratory Method

Yes ☒ No ☐ N/A ☐ Comments:

3.1 Was the correct laboratory method used?

ACTION: If no, contact lab to provide justification for method change compared to the requested method. Contact senior chemist to inform Client of change or to request variance.

OLIN-WILMINGTON
LEVEL I DATA QUALITY EVALUATION
STANDARD OPERATING PROCEDURE AND CHECKLIST
WET CHEMISTRY PARAMETERS BY VARIOUS METHODS

3.2 Are the practical quantitation limits the same as those specified by the
☐ QAPP/IRSWP ☐ Lab?

Yes ☒ No ☐ N/A ☐ Comments:

Note: The MADEP QA/QC Guidelines do not yet list PQLs for wet chemistry analyses, therefore all criteria will default to values stipulated in the QAPP. Where the QAPP does not define criteria, QA/QC requirements default to limits employed by the lab**. Other criteria may also apply.*

*except for NO₂ due to dilution
in subset of samples
All other Anions were detected.*

Ammonia* ☒ = 0.1 mg/ L

Alkalinity** ☐ = 1 mg/L

Bicarbonate Alkalinity** ☐ = 1 mg/L

Carbonate Alkalinity** ☐ = 1 mg/L

Nitrate Nitrogen as N* ☐ = .05 mg/L

Nitrite Nitrogen as N* ☐ = .01 mg/L

Chloride* ☐ = 1 mg/L

Hardness * ☐ = 2 mg/L

Spec. Cond.** ☐ 3 umhos/cm

Total Organic Carbon** ☐ = 1 mg/L

Oil & Grease* ☐ = 5.5 mg/L

Sulfate (EPA 300.0)* ☐ = 2 mg/L

COD:* Low - 20 mg/L

COD* High - 50 mg/L ☐

TDS* ☐ = 10 mg/L

TSS* ☐ = 5 mg/L

pH* ☐ < 2 to > 12

Phenolic - 0.01 mg/L

Other parameter(list) _____ PQL = _____ ☐ Source of PQL = _____

Other parameter(list) _____ PQL = _____ ☐ Source of PQL = _____

ACTION: If no, evaluate change with respect to sample matrix, preparation, dilution, moisture, etc. If sample PQL is indeterminate, contact lab for explanation.

3.3 Are the appropriate parameter results present for each sample in the SDG?

Yes ☒ No ☐ N/A ☐ Comments:

ACTION: If no, check Request for Analysis to verify if method was ordered and COC to verify that it was sent, and contact lab for resubmission of the missing data

3.4 If dilutions were required, were dilution factors reported?

Yes ☐ No ☐ N/A ☐ Comments:

ACTION: If no, contact the lab for submission.

4.0 Method Blanks

Yes ☒ No ☐ N/A ☐ Comments:

4.1 Are the Method Blank Summaries present?

ACTION: If no, call the laboratory for submission of missing data.

4.2 Was a method blank analyzed for each analysis batch of wet chemistry field samples of
20 or less?

Yes ☒ No ☐ N/A ☐ Comments:

**OLIN-WILMINGTON
LEVEL I DATA QUALITY EVALUATION
STANDARD OPERATING PROCEDURE AND CHECKLIST
WET CHEMISTRY PARAMETERS BY VARIOUS METHODS**

ACTION: If no, document discrepancy in case narrative and contact lab for justification. Consult senior chemist for action needed.

4.3 Is the method blank less than the PQL? (See Section 3.2 for PQLs).

Yes ☒

No ☐

N/A ☐

Comments:

4.4 Do any method blanks have positive results for wet chemistry parameters? Qualify data according to the following:

Yes ☐

No ☒

N/A ☐

Comments:

If the sample concentration is $< 5 \times$ blank value, flag sample result non-detect "U" at the PQL or the concentration reported if greater than the PQL.

If the sample concentration is $> 5 \times$ blank value, no qualification is needed.

ACTION: If any blank has positive results, list all the concentrations detected and flagging level (flagging level = $5 \times$ blank value) on the checklist. List all affected samples and their qualifiers.

5.0 Laboratory Control Standards

5.1 Was a laboratory control standard (LCS) run with each analytical batch of 20 samples or less?

Yes ☒

No ☐

N/A ☐

Comments:

ACTION: If no, call laboratory for LCS form submittal. If data is not available, use professional judgment to determine qualification actions for data associated with the batch.

5.2 Is a LCS Summary Form present?

Yes ☒

No ☐

N/A ☐

Comments:

ACTION: If no, contact lab for resubmission of missing data.

5.3 Is any wet chemistry analyte LCS recovery outside the control limits?

Yes ☐

No ☒

N/A ☐

Comments:

OLIN-WILMINGTON
LEVEL I DATA QUALITY EVALUATION
STANDARD OPERATING PROCEDURE AND CHECKLIST
WET CHEMISTRY PARAMETERS BY VARIOUS METHODS

LCS Limits:

Alkalinity** <input type="checkbox"/> = 80-120%	Bicarbonate Alkalinity** <input type="checkbox"/> = 80-120%	Carbonate Alkalinity** <input type="checkbox"/> = 80-120%	Specific Conductivity * <input checked="" type="checkbox"/> = 80-120%
Total Organic Carbon** <input type="checkbox"/> = 80-120%	TDS** <input type="checkbox"/> = 80-120%	Oil & Grease* <input type="checkbox"/> = 80-120%	Ammonia Nitrogen as N* <input checked="" type="checkbox"/> = 80-120%
COD Low* <input type="checkbox"/> = 80-120%	COD High* <input type="checkbox"/> = 80-120%	Nitrate Nitrogen as N** <input checked="" type="checkbox"/> = 80-120%	Nitrite Nitrogen as N** <input type="checkbox"/> = 80-120%
Hardness* <input type="checkbox"/> = 80-120%	Chloride* <input checked="" type="checkbox"/> = 80-120%	Sulfate (EPA 300.0)* <input checked="" type="checkbox"/> = 80-120%	pH* <input type="checkbox"/> = 98-102% TSS* NA

Other parameter(list) _____ %R = _____ ☐ Rec Limits = _____

Other parameter(list) _____ %R = _____ ☐ Rec Limits = _____

(MADEP has not yet defined LCS recovery limits for wet chemistry analyses.)

ACTION: If recovery is above the upper limit, qualify all positive sample results within the batch as (J). If recovery is below the lower limit, qualify all positive and no-detect results within the batch as (J). If LCS recovery is <10%, non-detect results are rejected (R).

6.0 Matrix Spikes

Matrix spikes may be collected at different frequencies based on monthly, quarterly, or task specific schedules. Confirm spike requirements for each set with the senior chemist.

6.1 Were project-specific MS/MSDs analyzed? List project samples that were spiked.

ACTION: If no, contact senior chemist to see if any were specified.

Yes ☒ No ☐ N/A ☐ Comments:

6.2 Is the MS/MSD Recovery Form present?

ACTION: If no, contact lab for resubmission of missing data.

Yes ☒ No ☐ N/A ☐ Comments:

6.3 Were matrix spikes analyzed at the required frequency of 1 per 20 samples per matrix?

ACTION: If any matrix spike data is missing, call lab for resubmission.

Yes ☒ No ☐ N/A ☐ Comments:

6.4 Are any wet chemistry analyte spike recoveries outside of the QC limits?

Yes ☒ No ☐ N/A ☐ Comments:

NH₃ 55-1-115?
Jall

OC-SW-18R

OLIN-WILMINGTON
LEVEL I DATA QUALITY EVALUATION
STANDARD OPERATING PROCEDURE AND CHECKLIST
WET CHEMISTRY PARAMETERS BY VARIOUS METHODS

NOTE: $\%R = \frac{(SSR-SR)}{SA} \times 100\%$
 SA = Spike added

Where: SSR = Spiked sample result
 SR = Sample result

MS/MSD Recovery Limits:

Alkalinity* = NA	Bicarbonate Alkalinity* = NA	Carbonate alkalinity* = NA	Ammonia* (LACHAT) <input checked="" type="checkbox"/> = 75-125%
Chloride*(SM 4500 Cl) <input checked="" type="checkbox"/> = 75-125%	Specific Conductivity * = NA	Total Organic Carbon* = NA	TDS** = NA
Oil & Grease* = NA	COD Low* <input type="checkbox"/> = 75-125%	COD High* <input type="checkbox"/> = 75-125%	Nitrate Nitrogen as N** <input checked="" type="checkbox"/> = 75-125%
Nitrite Nitrogen as N** <input checked="" type="checkbox"/> = 75-125%	Hardness* <input type="checkbox"/> = 75-125%	Sulfate (EPA 300.0)* <input checked="" type="checkbox"/> = 75-125%	pH* = NA
Other parameter(list) _____ % R = _____		Rec Limits = _____	

* = Laboratory Limits

** = Olin QAPP Limits (MADEP has not yet defined LCS recovery limits for wet chemistry analyses.)

NOTES: 1) If only one of the recoveries for an MS/MSD pair is outside of the control limits, no qualification is necessary. Use professional judgment for the MS/MSD flags.
 2) If the MS/MSD was performed by the laboratory on a non-project sample, no qualification is required.

ACTION: MS/MSD flags only apply to the sample spiked. Do not evaluate if sample concentration is > 4X spike. If the recoveries of the MS and MSD exceed the upper control limit, qualify positive results as estimated (J). If the recoveries of the MS and MSD are lower than the lower control limit but > 30%, qualify both positive results and non-detects (J). If the MS/MSD recovery is < 30% and the sample is non-detect, the results are considered unusable and flagged (R).

ACTION: Laboratory control limits apply when spiked sample results fall within the normal calibration range. If dilutions are required due to high sample concentrations, the data is evaluated, but no flags are applied.

6.5 Are any RPDs for MS/MSD recoveries outside of the QA/QC limits?

NOTE: $RPD = \frac{S-D}{(S+D)/2} \times 100\%$ Where S = MS result
 D = MSD result

Yes ☐ No ☒ N/A ☐ Comments:

MS/MSD RPD Limits:

RPD ≤ 20

7.0 Laboratory Duplicate

Are the RPDs for the laboratory duplicates <20% unless otherwise specified below?

Yes ☒ No ☐ N/A ☐ Comments:

Conductivity

OLIN-WILMINGTON
LEVEL I DATA QUALITY EVALUATION
STANDARD OPERATING PROCEDURE AND CHECKLIST
WET CHEMISTRY PARAMETERS BY VARIOUS METHODS

ACTION: If the RPD is greater than specified limits, qualify all results for that analyte as estimated (J).

pH* ☐ = 3%

Specific Conductivity *☒ = 5%

TSS** ☐ = 6%

TDS** ☐ = 6%

8.0 Sampling Accuracy

The majority of ground water samples are collected directly from a tap, process stream, or with dedicated tubing. Rinse blanks will not be collected.

8.1 Were rinsate blanks collected? Prior to evaluating rinsate blanks, obtain a list of the associated samples from the senior chemist.

Yes ☐

No ☒

N/A ☐

Comments:

8.2 Do any rinsate blanks have positive results?

Yes ☐

No ☐

N/A ☒

Comments:

ACTION: Evaluate rinsate results vs. blank results to determine if contaminant may be laboratory-derived. If not lab-related, qualify according to the table below.

If the sample concentration is $< 5 \times$ blank value, flag sample result non-detect "U" at the PQL or the concentration reported if greater than the PQL.

If the sample concentration is $> 5 \times$ blank value, no qualification is needed.

NOTE: MADEP does not require the collection of rinsate blanks.

9.0 Field Duplicates

9.1 Were field duplicate samples collected? Obtain a list of samples and their associated field duplicates.

Yes ☒

No ☐

N/A ☐

Comments:

9.2 Were field duplicates collected per the required frequency?

Yes ☒

No ☐

N/A ☐

Comments:

QAPP/IRSWP ☒ MADEP Option 1 (1 per 20) ☐ MADEP Option 3 (1 per 10) ☐

9.3 Was the RPD $\leq 30\%$ for waters $\leq 50\%$ for soils? Calculate the RPD for results and attach to this review.

Yes ☒

No ☐

N/A ☐

Comments:

OLIN-WILMINGTON
LEVEL I DATA QUALITY EVALUATION
STANDARD OPERATING PROCEDURE AND CHECKLIST
WET CHEMISTRY PARAMETERS BY VARIOUS METHODS

ACTION:. Qualify data (J) for both sample results if the RPD exceeded.

Was any of the data qualified?

Yes ☒

No ☐

N/A ☐

Comments:

If so, apply data qualifiers directly to the DQE copy of laboratory report and **flag pages** for entry in database.

N/A 3

REFERENCES:-

MACTEC, 2007. "Draft Interim Response Steps Work Plan"; Olin Chemical Superfund Site, 51 Eames Street, Wilmington, Massachusetts.; Project No. 6300-06-0010/41.1; July 25, 2007.

Massachusetts Department of Environmental Protection (MADEP), 2004. "The Compendium of Quality Assurance and Quality Control Requirements and Performance Standards for Selected Analytical Methods Used in Support of Response Actions for the Massachusetts Contingency Plan (MCP)"; Bureau of Waste Site Cleanup; 1 Winter Street, Boston, Massachusetts 02108; WSC-CAM; May 2004.

ANALYTICAL REPORT

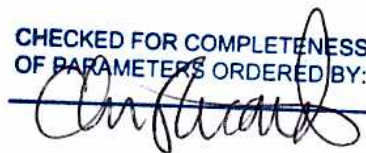
Job Number: 360-25577-1

Job Description: Olin Chemical Surface Water Quarterly

For:

Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441
Attention: Mr. Steven Morrow

CHECKED FOR COMPLETENESS
OF PARAMETERS ORDERED BY:



Approved for release.
Joe Chimi
Report Production Representative
11/25/2009 11:37 AM

Designee for
Becky C Mason
Project Manager II
becky.mason@testamericainc.com
11/25/2009

Results relate only to the items tested and the sample(s) as received by the laboratory. The test results in this report meet all NELAC requirements for accredited parameters, exceptions are noted in this report. Pursuant to NELAC, this report may not be reproduced except in full, and with written approval from the laboratory. TestAmerica Westfield Certifications and Approvals: MADEP MA014, RIDOH57, CTDPH 0494, VT DECWSD, NH DES 2539, NELAP FL E87912 TOX, NELAP NJ MA008 TOX, NELAP NY 10843, NY ELAP 10843, North Carolina 647, NELAP PA 68-04386. Field sampling is performed under SOPs WE-FLD-001 and WE-FLD-002.

TestAmerica Laboratories, Inc.

TestAmerica Westfield Westfield Executive Park, 53 Southampton Road, Westfield, MA 01085

Tel (413) 572-4000 Fax (413) 572-3707 www.testamericainc.com



Table of Contents

Cover Title Page	1
Report Narrative	3
Executive Summary	7
Method Summary	10
Method / Analyst Summary	11
Sample Summary	12
Sample Results	13
Sample Datasheets	14
Data Qualifiers	30
QC Results	31
Qc Association Summary	32
Qc Reports	36
Shipping and Receiving Documents	46
Sample Receipt Checklist	47
Client Chain of Custody	48

MADEP MCP Analytical Method Report Certification Form

Laboratory Name: TestAmerica Westfield	Project #: 360-25577-1
Project Location: MADEP RTN¹:	
This form provides certifications for the following data set:[list Laboratory Sample ID Number(s)] 360-25577-(1-8)	
Sample Matrices:	Groundwater Soil/Sediment Drinking Water Other:
MCP SW-846 Methods Used	8260B () 8151A () 8330 () 6010B (x) 7470A/1A () Other ()
	8270C () 8081A () VPH () 6020 () 9014M ² /9012 ()
	8082 () 8021B () EPH () 7000 S ³ () 7196A ()
As specified in MADEP Compendium of Analytical Methods. (check all that apply)	1 List Release Tracking Number (RTN), if known 2 M - SW-846 Method 9014 or MADEP Physiologically Available Cyanide (PAC) Method 3 S - SW-846 Methods 7000 Series List individual method and analyte.

An affirmative response to questions A, B, C and D is required for "Presumptive Certainty" status

A	Were all samples received by the laboratory in a condition consistent with that described on the Chain-of-Custody documentation for the data set?	Yes √	No ¹
B	Were all QA/QC procedures required for the specified analytical method(s) included in this report followed, including the requirement to note and discuss in a narrative QC data that did not meet appropriate performance standards or guidelines?	Yes √	No ¹
C	Does the analytical data included in this report meet all the requirements for "Presumptive Certainty", as described in Section 2.0 (a), (b), (c) and (d) of the MADEP document CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?	Yes √	N/A No ¹
D	VPH and EPH methods only: Was the VPH or EPH Method conducted without significant modifications (see Section 11.3 of respective Methods)?	Yes √	N/A No ¹

A response to questions E and F below is required for "Presumptive Certainty" status

E	Were all QC performance standards and recommendations for the specified methods achieved?	Yes √	No ¹
F	Were results for all analyte-list compounds/elements for the specified method(s) reported?	Yes √	N/A No ¹

¹ All Negative responses must be addressed in an attached Environmental Laboratory case narrative.

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, accurate and complete.

Signature:



Position: Laboratory Director

Printed Name: Steven C. Hartmann

Date: 11/25/09 11:29

The certification form has been electronically signed and approved.

CAM VII A, Rev 3.2

April-04



MADEP MA014
NY DOH 10843
RI DOH 57
CT DPH 0494
VT DECWSD

NELAP FL E87912 TOX
NELAP NJ MA008 TOX
NELAP NY 10843
NH DES 253901-A



TestAmerica Westfield
53 Southampton Rd,
Westfield, MA 01085
Tel: (413) 572-4000
Fax: (413) 572-3707

MADEP MCP Analytical Method Report Certification Form

Laboratory Name: TestAmerica Westfield		Project #: 360-25577-1	
Project Location:		MADEP RTN ¹ :	
This form provides certifications for the following data set:[list Laboratory Sample ID Number(s)] 360-25577-(1-8)			
Sample Matrices:	Groundwater	Soil/Sediment	Drinking Water Other:
MCP SW-846 Methods Used	8260B ()	8151A ()	8330 () 6010B () 7470A/1A () Other (x)
	8270C ()	8081A ()	VPH () 6020 () 9014M ² /9012 ()
As specified in MADEP Compendium of Analytical Methods. (check all that apply)	8082 ()	8021B ()	EPH () 7000 S ³ () 7196A ()
1 List Release Tracking Number (RTN), if known 2 M - SW-846 Method 9014 or MADEP Physiologically Available Cyanide (PAC) Method 3 S - SW-846 Methods 7000 Series List individual method and analyte.			

An affirmative response to questions A, B, C and D is required for "Presumptive Certainty" status

A	Were all samples received by the laboratory in a condition consistent with that described on the Chain-of-Custody documentation for the data set?	Yes √	No ¹
B	Were all QA/QC procedures required for the specified analytical method(s) included in this report followed, including the requirement to note and discuss in a narrative QC data that did not meet appropriate performance standards or guidelines?	Yes √	No ¹
C	Does the analytical data included in this report meet all the requirements for "Presumptive Certainty", as described in Section 2.0 (a), (b), (c) and (d) of the MADEP document CAM VII A, " Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?	Yes N/A √	No ¹
D	VPH and EPH methods only: Was the VPH or EPH Method conducted without significant modifications (see Section 11.3 of respective Methods)?	Yes N/A √	No ¹

A response to questions E and F below is required for "Presumptive Certainty" status

E	Were all QC performance standards and recommendations for the specified methods achieved?	Yes	No ¹ √
F	Were results for all analyte-list compounds/elements for the specified method(s) reported?	Yes N/A √	No ¹

¹ All Negative responses must be addressed in an attached Environmental Laboratory case narrative.

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, accurate and complete.

Signature:



Position: Laboratory Director

Printed Name: Steven C. Hartmann

Date: 11/25/09 11:29

The certification form has been electronically signed and approved.

CAM VII A, Rev 3.2

April-04



MADEP MA014
NY DOH 10843
RI DOH 57
CT DPH 0494
VT DECWSD

NELAP FL E87912 TOX
NELAP NJ MA008 TOX
NELAP NY 10843
NH DES 253901-A



TestAmerica Westfield
53 Southampton Rd,
Westfield, MA 01085
Tel:(413)572-4000
Fax:(413)572-3707

CASE NARRATIVE

Client: Olin Corporation

Project: Olin Chemical Surface Water Quarterly

Report Number: 360-25577-1

This case narrative is in the form of an exception report, where only the anomalies related to this report, method specific performance and/or QA/QC issues are discussed. If there are no issues to report, this narrative will include a statement that documents that there are no relevant data issues.

It should be noted that samples with elevated Reporting Limits (RLs) as a result of a dilution may not be able to satisfy customer reporting limits in some cases. Such increases in the RLs are unavoidable but acceptable consequence of sample dilution that enables quantification of target analytes or interferences which exceed the calibration range of the instrument.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT

The samples were received on 11/12/2009; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was C.

Note: All samples which require thermal preservation are considered acceptable if the arrival temperature is within 2C of the required temperature or method specified range. For samples with a specified temperature of 4C, samples with a temperature ranging from just above freezing temperature of water to 6C shall be acceptable. Samples that are hand delivered immediately following collection may not meet these criteria, however they will be deemed acceptable according to NELAC standards, if there is evidence that the chilling process has begun, such as arrival on ice, etc.

MCP regulatory standard criteria were not specified for this report. Therefore, method reporting limits (RLs) were not assessed against any MCP standards as it may pertain to Question "E" on the Presumptive Certainty Certification Form (MADEP reference: WSC-CAM-AN-093008 - WSC-CAM Analytical Notes).

TOTAL METALS

Samples 360-25577-1 through 360-25577-8 were analyzed for total metals in accordance with EPA SW-846 Method 6010B. The samples were prepared and analyzed on 11/13/2009.

At the request of the client, an abbreviated/modified MCP analyte list was reported for this job.

No difficulties were encountered during the metals analyses.

All quality control parameters were within the acceptance limits.

DISSOLVED METALS

Samples 360-25577-1 through 360-25577-8 were analyzed for dissolved metals in accordance with EPA SW-846 Method 6010B. The samples were analyzed on 11/13/2009.

At the request of the client, an abbreviated/modified MCP analyte list was reported for this job.

No difficulties were encountered during the dissolved metals analyses.

All quality control parameters were within the acceptance limits.

ANIONS

Samples 360-25577-1 through 360-25577-8 were analyzed for anions in accordance with EPA Method 300.0. The samples were analyzed on 11/13/2009.

Samples 360-25577-1 through 360-25577-8(10X) required dilution prior to analysis due to high target concentration. The reporting limits have been adjusted accordingly.

No difficulties were encountered during the anions analyses.

All quality control parameters were within the acceptance limits.

AMMONIA

Samples 360-25577-1 through 360-25577-8 were analyzed for ammonia in accordance with LACHAT 107-06-1B. The samples were prepared and analyzed on 11/24/2009.

Ammonia failed the recovery criteria low for the MS of sample 360-25577-6 in batch 360-52157. The presence of the '4' qualifier in the report indicates analytes where the concentration in the unspiked sample exceeded four times the spiking amount. The associated LCS recovered within control limits. Refer to the QC report for details.

Samples 360-25577-2(10X), 360-25577-3(10X), 360-25577-4 through 360-25577-7(5X) and 360-25577-8(10X) required dilution prior to analysis due to high concentration. The reporting limits have been adjusted accordingly.

No other difficulties were encountered during the ammonia analyses.

All other quality control parameters were within the acceptance limits.

SPECIFIC CONDUCTANCE

Samples 360-25577-1 through 360-25577-8 were analyzed for specific conductance in accordance with SM 2510B. The samples were analyzed on 11/13/2009.

No difficulties were encountered during the specific conductance analyses.

All quality control parameters were within the acceptance limits.

EXECUTIVE SUMMARY - Detections

Client: Olin Corporation

Job Number: 360-25577-1

Lab Sample ID Analyte	Client Sample ID	Result / Qualifier	Reporting Limit	Units	Method
360-25577-1	OC-SW-ISCO3				
Aluminum		55 J	100	ug/L	6010B
Sodium		60000	2000	ug/L	6010B
Sulfate		31	2.0	mg/L	300.0
Nitrate as N		0.97	0.050	mg/L	300.0
Chloride		160	10	mg/L	300.0
Ammonia		1.5	0.10	mg/L	L107-06-1B
Specific Conductance		650	1.0	umhos/cm	SM 2510B
<i>Dissolved</i>					
Sodium		79000	2000	ug/L	6010B
360-25577-2	OC-SW-ISCO2				
Aluminum		350	100	ug/L	6010B
Chromium		68	5.0	ug/L	6010B
Sodium		120000	2000	ug/L	6010B
Sulfate		510	20	mg/L	300.0
Nitrate as N		1.4	0.050	mg/L	300.0
Chloride		170	10	mg/L	300.0
Ammonia		83	1.0	mg/L	L107-06-1B
Specific Conductance		1600	1.0	umhos/cm	SM 2510B
<i>Dissolved</i>					
Aluminum		110	100	ug/L	6010B
Chromium		29	5.0	ug/L	6010B
Sodium		150000	2000	ug/L	6010B
360-25577-3	OC-SW-PZ16RR				
Aluminum		4800	100	ug/L	6010B
Chromium		1000	5.0	ug/L	6010B
Sodium		150000	2000	ug/L	6010B
Sulfate		380	20	mg/L	300.0
Nitrate as N		3.9	0.050	mg/L	300.0
Chloride		250	10	mg/L	300.0
Ammonia		57	1.0	mg/L	L107-06-1B
Specific Conductance		1600	1.0	umhos/cm	SM 2510B
<i>Dissolved</i>					
Aluminum		93 J	100	ug/L	6010B
Chromium		60	5.0	ug/L	6010B
Sodium		170000	2000	ug/L	6010B

EXECUTIVE SUMMARY - Detections

Client: Olin Corporation

Job Number: 360-25577-1

Lab Sample ID Analyte	Client Sample ID	Result / Qualifier	Reporting Limit	Units	Method
360-25577-4	OC-SW-PZ17RR				
Aluminum		3400	100	ug/L	6010B
Chromium		770	5.0	ug/L	6010B
Sodium		130000	2000	ug/L	6010B
Sulfate		250	20	mg/L	300.0
Nitrate as N		4.0	0.050	mg/L	300.0
Chloride		240	10	mg/L	300.0
Ammonia		37	0.50	mg/L	L107-06-1B
Specific Conductance		1300	1.0	umhos/cm	SM 2510B
<i>Dissolved</i>					
Aluminum		70 J	100	ug/L	6010B
Chromium		68	5.0	ug/L	6010B
Sodium		150000	2000	ug/L	6010B
360-25577-5	OC-SW-SD17				
Aluminum		2700	100	ug/L	6010B
Chromium		620	5.0	ug/L	6010B
Sodium		130000	2000	ug/L	6010B
Sulfate		200	20	mg/L	300.0
Nitrate as N		4.3	0.050	mg/L	300.0
Chloride		230	10	mg/L	300.0
Ammonia		28	0.50	mg/L	L107-06-1B
Specific Conductance		1300	1.0	umhos/cm	SM 2510B
<i>Dissolved</i>					
Aluminum		70 J	100	ug/L	6010B
Chromium		59	5.0	ug/L	6010B
Sodium		140000	2000	ug/L	6010B
360-25577-6	OC-SW-18R				
Aluminum		290	100	ug/L	6010B
Chromium		36	5.0	ug/L	6010B
Sodium		74000	2000	ug/L	6010B
Sulfate		140	20	mg/L	300.0
Chloride		110	10	mg/L	300.0
Ammonia		36	0.50	mg/L	L107-06-1B
Specific Conductance		800	1.0	umhos/cm	SM 2510B
<i>Dissolved</i>					
Aluminum		75 J	100	ug/L	6010B
Chromium		12	5.0	ug/L	6010B
Sodium		82000	2000	ug/L	6010B

EXECUTIVE SUMMARY - Detections

Client: Olin Corporation

Job Number: 360-25577-1

Lab Sample ID Analyte	Client Sample ID	Result / Qualifier	Reporting Limit	Units	Method
360-25577-7	OC-SW-18R-DUP				
Aluminum		280	100	ug/L	6010B
Chromium		34	5.0	ug/L	6010B
Sodium		71000	2000	ug/L	6010B
Sulfate		150	20	mg/L	300.0
Chloride		110	10	mg/L	300.0
Ammonia		33	0.50	mg/L	L107-06-1B
Specific Conductance		800	1.0	umhos/cm	SM 2510B
<i>Dissolved</i>					
Aluminum		84 J	100	ug/L	6010B
Chromium		13	5.0	ug/L	6010B
Sodium		83000	2000	ug/L	6010B
360-25577-8	OC-SW-ISCO1				
Aluminum		280	100	ug/L	6010B
Chromium		34	5.0	ug/L	6010B
Sodium		71000	2000	ug/L	6010B
Sulfate		150	20	mg/L	300.0
Chloride		120	10	mg/L	300.0
Ammonia		33	1.0	mg/L	L107-06-1B
Specific Conductance		790	1.0	umhos/cm	SM 2510B
<i>Dissolved</i>					
Aluminum		73 J	100	ug/L	6010B
Chromium		12	5.0	ug/L	6010B
Sodium		81000	2000	ug/L	6010B

METHOD SUMMARY

Client: Olin Corporation

Job Number: 360-25577-1

Description	Lab Location	Method	Preparation Method
Matrix: Water			
Dissolved Metals	TAL WFD	SW846 6010B	
Total Metals	TAL WFD	SW846 6010B	
Sample Filtration, Field	TAL WFD		FIELD_FLTRD
Preparation, Total Metals	TAL WFD		SW846 3010A
Chloride & Sulfate	TAL WFD	40CFR136A 300.0	
Nitrate & Nitrite	TAL WFD	40CFR136A 300.0	
Nitrogen Ammonia	TAL WFD	LACHAT L107-06-1B	
Distillation, Ammonia	TAL WFD		Distill/Ammonia
Conductivity, Specific Conductance	TAL WFD	SM SM 2510B	

Lab References:

TAL WFD = TestAmerica Westfield

Method References:

40CFR136A = "Methods for Organic Chemical Analysis of Municipal Industrial Wastewater", 40CFR, Part 136, Appendix A, October 26, 1984 and subsequent revisions.

LACHAT = LACHAT

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

METHOD / ANALYST SUMMARY

Client: Olin Corporation

Job Number: 360-25577-1

Method	Analyst	Analyst ID
SW846 6010B	Smith, Tim J	TJS
40CFR136A 300.0	Lalashius, Andrew L	ALL
LACHAT L107-06-1B	Lalashius, Andrew L	ALL
SM SM 2510B	Emerich, Rich W	RWE

SAMPLE SUMMARY

Client: Olin Corporation

Job Number: 360-25577-1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
360-25577-1	OC-SW-ISCO3	Water	11/12/2009 0855	11/12/2009 1645
360-25577-2	OC-SW-ISCO2	Water	11/12/2009 0910	11/12/2009 1645
360-25577-3	OC-SW-PZ16RR	Water	11/12/2009 0930	11/12/2009 1645
360-25577-4	OC-SW-PZ17RR	Water	11/12/2009 0950	11/12/2009 1645
360-25577-5	OC-SW-SD17	Water	11/12/2009 1005	11/12/2009 1645
360-25577-6	OC-SW-18R	Water	11/12/2009 1020	11/12/2009 1645
360-25577-6MS	OC-SW-18R-MS	Water	11/12/2009 1020	11/12/2009 1645
360-25577-6MSD	OC-SW-18R-MSD	Water	11/12/2009 1020	11/12/2009 1645
360-25577-7	OC-SW-18R-DUP	Water	11/12/2009 1020	11/12/2009 1645
360-25577-8	OC-SW-ISCO1	Water	11/12/2009 1050	11/12/2009 1645

SAMPLE RESULTS

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-25577-1

Client Sample ID: OC-SW-ISCO3
Lab Sample ID: 360-25577-1

Date Sampled: 11/12/2009 0855
Date Received: 11/12/2009 1645
Client Matrix: Water

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B		Date Analyzed:		11/13/2009 1514	
Aluminum	ND	ug/L	39	100	1.0
Chromium	ND	ug/L	1.3	5.0	1.0
Sodium	79000 J	ug/L	250	2000	1.0
Method: 6010B		Date Analyzed:		11/13/2009 1426	
Prep Method: 3010A		Date Prepared:		11/13/2009 0746	
Aluminum	55 J	ug/L	39	100	1.0
Chromium	ND	ug/L	1.3	5.0	1.0
Sodium	60000 J	ug/L	250	2000	1.0

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-25577-1

Client Sample ID: OC-SW-ISCO3
Lab Sample ID: 360-25577-1

Date Sampled: 11/12/2009 0855
Date Received: 11/12/2009 1645
Client Matrix: Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0			Date Analyzed:	11/13/2009 1653	
Sulfate	31	mg/L	2.0	2.0	1.0
Nitrate as N	0.97	mg/L	0.050	0.050	1.0
Nitrite as N	ND	mg/L	0.010	0.010	1.0
Method: 300.0			Date Analyzed:	11/13/2009 1708	
Chloride	160	mg/L	10	10	10
Method: L107-06-1B			Date Analyzed:	11/24/2009 1537	
Prep Method: Distill/Ammonia			Date Prepared:	11/24/2009 1333	
Ammonia	1.5 <i>5</i>	mg/L	0.10	0.10	1.0
Method: SM 2510B			Date Analyzed:	11/13/2009 0929	
Specific Conductance	650	umhos/cm	1.0	1.0	1.0

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-25577-1

Client Sample ID: OC-SW-ISCO2
Lab Sample ID: 360-25577-2

Date Sampled: 11/12/2009 0910
Date Received: 11/12/2009 1645
Client Matrix: Water

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B		Date Analyzed: 11/13/2009 1522			
Aluminum	110	ug/L	39	100	1.0
Chromium	29	ug/L	1.3	5.0	1.0
Sodium	150000 J	ug/L	250	2000	1.0
Method: 6010B		Date Analyzed: 11/13/2009 1429			
Prep Method: 3010A		Date Prepared: 11/13/2009 0746			
Aluminum	350	ug/L	39	100	1.0
Chromium	68	ug/L	1.3	5.0	1.0
Sodium	120000 J	ug/L	250	2000	1.0

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-25577-1

Client Sample ID: OC-SW-ISCO2
Lab Sample ID: 360-25577-2

Date Sampled: 11/12/2009 0910
Date Received: 11/12/2009 1645
Client Matrix: Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0					
		Date Analyzed:	11/13/2009 1725		
Nitrate as N	1.4	mg/L	0.050	0.050	1.0
Nitrite as N	ND	mg/L	0.010	0.010	1.0
Method: 300.0					
		Date Analyzed:	11/13/2009 1740		
Sulfate	510	mg/L	20	20	10
Chloride	170	mg/L	10	10	10
Method: L107-06-1B					
		Date Analyzed:	11/24/2009 1612		
Prep Method: Distill/Ammonia		Date Prepared:	11/24/2009 1333		
Ammonia	83 J	mg/L	1.0	1.0	10
Method: SM 2510B					
		Date Analyzed:	11/13/2009 0932		
Specific Conductance	1600	umhos/cm	1.0	1.0	1.0

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-25577-1

Client Sample ID: OC-SW-PZ16RR
Lab Sample ID: 360-25577-3

Date Sampled: 11/12/2009 0930
Date Received: 11/12/2009 1645
Client Matrix: Water

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B		Date Analyzed: 11/13/2009 1526			
Aluminum	93 J	ug/L	39	100	1.0
Chromium	60	ug/L	1.3	5.0	1.0
Sodium	170000 J	ug/L	250	2000	1.0
Method: 6010B		Date Analyzed: 11/13/2009 1432			
Prep Method: 3010A		Date Prepared: 11/13/2009 0746			
Aluminum	4800	ug/L	39	100	1.0
Chromium	1000	ug/L	1.3	5.0	1.0
Sodium	150000 J	ug/L	250	2000	1.0

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-25577-1

Client Sample ID: OC-SW-PZ16RR
Lab Sample ID: 360-25577-3

Date Sampled: 11/12/2009 0930
Date Received: 11/12/2009 1645
Client Matrix: Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0			Date Analyzed:	11/13/2009 1756	
Nitrate as N	3.9	mg/L	0.050	0.050	1.0
Method: 300.0			Date Analyzed:	11/13/2009 1811	
Sulfate	380	mg/L	20	20	10
Chloride	250	mg/L	10	10	10
Nitrite as N	ND	mg/L	0.10	0.10	10
Method: L107-06-1B			Date Analyzed:	11/24/2009 1613	
Prep Method: Distill/Ammonia			Date Prepared:	11/24/2009 1333	
Ammonia	57 J	mg/L	1.0	1.0	10
Method: SM 2510B			Date Analyzed:	11/13/2009 0934	
Specific Conductance	1600	umhos/cm	1.0	1.0	1.0

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-25577-1

Client Sample ID: OC-SW-PZ17RR
Lab Sample ID: 360-25577-4

Date Sampled: 11/12/2009 0950
Date Received: 11/12/2009 1645
Client Matrix: Water


Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B		Date Analyzed: 11/13/2009 1529			
Aluminum	70 J	ug/L	39	100	1.0
Chromium	68	ug/L	1.3	5.0	1.0
Sodium	150000 J	ug/L	250	2000	1.0
Method: 6010B		Date Analyzed: 11/13/2009 1435			
Prep Method: 3010A		Date Prepared: 11/13/2009 0746			
Aluminum	3400	ug/L	39	100	1.0
Chromium	770	ug/L	1.3	5.0	1.0
Sodium	130000 J	ug/L	250	2000	1.0

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-25577-1

Client Sample ID: OC-SW-PZ17RR
Lab Sample ID: 360-25577-4

Date Sampled: 11/12/2009 0950
Date Received: 11/12/2009 1645
Client Matrix: Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0 Nitrate as N	4.0	mg/L	0.050	0.050	1.0
Method: 300.0 Sulfate	250	mg/L	20	20	10
Chloride	240	mg/L	10	10	10
Nitrite as N	ND	mg/L	0.10	0.10	10
Method: L107-06-1B Prep Method: Distill/Ammonia Ammonia	37 	mg/L	0.50	0.50	5.0
Method: SM 2510B Specific Conductance	1300	umhos/cm	1.0	1.0	1.0

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-25577-1

Client Sample ID: OC-SW-SD17
Lab Sample ID: 360-25577-5

Date Sampled: 11/12/2009 1005
Date Received: 11/12/2009 1645
Client Matrix: Water

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B			Date Analyzed:	11/13/2009 1532	
Aluminum	70 J	ug/L	39	100	1.0
Chromium	59	ug/L	1.3	5.0	1.0
Sodium	140000	ug/L	250	2000	1.0
Method: 6010B			Date Analyzed:	11/13/2009 1438	
Prep Method: 3010A			Date Prepared:	11/13/2009 0746	
Aluminum	2700	ug/L	39	100	1.0
Chromium	620	ug/L	1.3	5.0	1.0
Sodium	130000	ug/L	250	2000	1.0

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-25577-1

Client Sample ID: OC-SW-SD17
Lab Sample ID: 360-25577-5

Date Sampled: 11/12/2009 1005
Date Received: 11/12/2009 1645
Client Matrix: Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0			Date Analyzed:	11/13/2009 1926	
Nitrate as N	4.3	mg/L	0.050	0.050	1.0
Method: 300.0			Date Analyzed:	11/13/2009 1941	
Sulfate	200	mg/L	20	20	10
Chloride	230	mg/L	10	10	10
Nitrite as N	ND	mg/L	0.10	0.10	10
Method: L107-06-1B			Date Analyzed:	11/24/2009 1615	
Prep Method: Distill/Ammonia			Date Prepared:	11/24/2009 1333	
Ammonia	28	mg/L	0.50	0.50	5.0
Method: SM 2510B			Date Analyzed:	11/13/2009 0936	
Specific Conductance	1300	umhos/cm	1.0	1.0	1.0

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-25577-1

Client Sample ID: OC-SW-18R
Lab Sample ID: 360-25577-6

Date Sampled: 11/12/2009 1020
Date Received: 11/12/2009 1645
Client Matrix: Water


Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B		Date Analyzed: 11/13/2009 1502			
Aluminum	75 J	ug/L	39	100	1.0
Chromium	12	ug/L	1.3	5.0	1.0
Sodium	82000 J	ug/L	250	2000	1.0
Method: 6010B		Date Analyzed: 11/13/2009 1446			
Prep Method: 3010A		Date Prepared: 11/13/2009 0746			
Aluminum	290	ug/L	39	100	1.0
Chromium	36	ug/L	1.3	5.0	1.0
Sodium	74000 J	ug/L	250	2000	1.0

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-25577-1

Client Sample ID: OC-SW-18R
Lab Sample ID: 360-25577-6

Date Sampled: 11/12/2009 1020
Date Received: 11/12/2009 1645
Client Matrix: Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0			Date Analyzed:	11/13/2009 1553	
Nitrate as N	ND	mg/L	0.050	0.050	1.0
Nitrite as N	ND	mg/L	0.010	0.010	1.0
Method: 300.0			Date Analyzed:	11/13/2009 1608	
Sulfate	140	mg/L	20	20	10
Chloride	110	mg/L	10	10	10
Method: L107-06-1B			Date Analyzed:	11/24/2009 1616	
Prep Method: Distill/Ammonia			Date Prepared:	11/24/2009 1333	
Ammonia	36 	mg/L	0.50	0.50	5.0
Method: SM 2510B			Date Analyzed:	11/13/2009 0938	
Specific Conductance	800	umhos/cm	1.0	1.0	1.0

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-25577-1

Client Sample ID: OC-SW-18R-DUP
Lab Sample ID: 360-25577-7

Date Sampled: 11/12/2009 1020
Date Received: 11/12/2009 1645
Client Matrix: Water

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B		Date Analyzed: 11/13/2009 1542			
Aluminum	84 J	ug/L	39	100	1.0
Chromium	13	ug/L	1.3	5.0	1.0
Sodium	83000 5	ug/L	250	2000	1.0
Method: 6010B		Date Analyzed: 11/13/2009 1455			
Prep Method: 3010A		Date Prepared: 11/13/2009 0746			
Aluminum	280	ug/L	39	100	1.0
Chromium	34	ug/L	1.3	5.0	1.0
Sodium	71000 5	ug/L	250	2000	1.0

Mr. Steven Morrow
 Olin Corporation
 3855 North Ocoee Street
 Suite 200
 Cleveland, TN 37312-4441

Job Number: 360-25577-1

Client Sample ID: OC-SW-18R-DUP
 Lab Sample ID: 360-25577-7

Date Sampled: 11/12/2009 1020
 Date Received: 11/12/2009 1645
 Client Matrix: Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0					
		Date Analyzed:	11/13/2009	1956	
Nitrate as N	ND	mg/L	0.050	0.050	1.0
Nitrite as N	ND	mg/L	0.010	0.010	1.0
Method: 300.0					
		Date Analyzed:	11/13/2009	2011	
Sulfate	150	mg/L	20	20	10
Chloride	110	mg/L	10	10	10
Method: L107-06-1B					
Prep Method: Distill/Ammonia					
Ammonia	33 J	mg/L	0.50	0.50	5.0
Method: SM 2510B					
Specific Conductance	800	umhos/cm	1.0	1.0	1.0

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-25577-1

Client Sample ID: OC-SW-ISCO1
Lab Sample ID: 360-25577-8

Date Sampled: 11/12/2009 1050
Date Received: 11/12/2009 1645
Client Matrix: Water

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B					
			Date Analyzed:	11/13/2009 1545	
Aluminum	73 J	ug/L	39	100	1.0
Chromium	12	ug/L	1.3	5.0	1.0
Sodium	81000 J	ug/L	250	2000	1.0
Method: 6010B					
			Date Analyzed:	11/13/2009 1459	
Prep Method: 3010A			Date Prepared:	11/13/2009 0746	
Aluminum	280	ug/L	39	100	1.0
Chromium	34	ug/L	1.3	5.0	1.0
Sodium	71000 J	ug/L	250	2000	1.0

Mr. Steven Morrow
Olin Corporation
3855 North Ocoee Street
Suite 200
Cleveland, TN 37312-4441

Job Number: 360-25577-1

Client Sample ID: OC-SW-ISCO1
Lab Sample ID: 360-25577-8

Date Sampled: 11/12/2009 1050
Date Received: 11/12/2009 1645
Client Matrix: Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 300.0			Date Analyzed:	11/13/2009 2026	
Nitrate as N	ND	mg/L	0.050	0.050	1.0
Nitrite as N	ND	mg/L	0.010	0.010	1.0
Method: 300.0			Date Analyzed:	11/13/2009 2041	
Sulfate	150	mg/L	20	20	10
Chloride	120	mg/L	10	10	10
Method: L107-06-1B			Date Analyzed:	11/24/2009 1622	
Prep Method: Distill/Ammonia			Date Prepared:	11/24/2009 1333	
Ammonia	33	mg/L	1.0	1.0	10
Method: SM 2510B			Date Analyzed:	11/13/2009 0941	
Specific Conductance	790	umhos/cm	1.0	1.0	1.0

DATA REPORTING QUALIFIERS

Client: Olin Corporation

Job Number: 360-25577-1

Lab Section	Qualifier	Description
Metals		
	4	MS, MSD: The analyte present in the original sample is 4 times greater than the matrix spike concentration; therefore, control limits are not applicable.
	J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
General Chemistry		
	F	MS or MSD exceeds the control limits

QUALITY CONTROL RESULTS

Quality Control Results

Client: Olin Corporation

Job Number: 360-25577-1

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
Metals					
Prep Batch: 360-51587					
LCS 360-51587/2-A	Lab Control Sample	T	Water	3010A	
LCSD 360-51587/3-A	Lab Control Sample Duplicate	T	Water	3010A	
MB 360-51587/1-A	Method Blank	T	Water	3010A	
360-25577-1	OC-SW-ISCO3	T	Water	3010A	
360-25577-2	OC-SW-ISCO2	T	Water	3010A	
360-25577-3	OC-SW-PZ16RR	T	Water	3010A	
360-25577-4	OC-SW-PZ17RR	T	Water	3010A	
360-25577-5	OC-SW-SD17	T	Water	3010A	
360-25577-6	OC-SW-18R	T	Water	3010A	
360-25577-6MS	Matrix Spike	T	Water	3010A	
360-25577-6MSD	Matrix Spike Duplicate	T	Water	3010A	
360-25577-7	OC-SW-18R-DUP	T	Water	3010A	
360-25577-8	OC-SW-ISCO1	T	Water	3010A	
Analysis Batch:360-51650					
LCS 360-51587/2-A	Lab Control Sample	T	Water	6010B	360-51587
LCSD 360-51587/3-A	Lab Control Sample Duplicate	T	Water	6010B	360-51587
MB 360-51587/1-A	Method Blank	T	Water	6010B	360-51587
360-25577-1	OC-SW-ISCO3	T	Water	6010B	360-51587
360-25577-2	OC-SW-ISCO2	T	Water	6010B	360-51587
360-25577-3	OC-SW-PZ16RR	T	Water	6010B	360-51587
360-25577-4	OC-SW-PZ17RR	T	Water	6010B	360-51587
360-25577-5	OC-SW-SD17	T	Water	6010B	360-51587
360-25577-6	OC-SW-18R	T	Water	6010B	360-51587
360-25577-6MS	Matrix Spike	T	Water	6010B	360-51587
360-25577-6MSD	Matrix Spike Duplicate	T	Water	6010B	360-51587
360-25577-7	OC-SW-18R-DUP	T	Water	6010B	360-51587
360-25577-8	OC-SW-ISCO1	T	Water	6010B	360-51587
Analysis Batch:360-51674					
LCS 360-51674/20	Lab Control Sample	T	Water	6010B	
LCSD 360-51674/27	Lab Control Sample Duplicate	T	Water	6010B	
MB 360-51674/21	Method Blank	T	Water	6010B	
360-25577-1	OC-SW-ISCO3	D	Water	6010B	
360-25577-2	OC-SW-ISCO2	D	Water	6010B	
360-25577-3	OC-SW-PZ16RR	D	Water	6010B	
360-25577-4	OC-SW-PZ17RR	D	Water	6010B	
360-25577-5	OC-SW-SD17	D	Water	6010B	
360-25577-6	OC-SW-18R	D	Water	6010B	
360-25577-6MS	Matrix Spike	D	Water	6010B	
360-25577-6MSD	Matrix Spike Duplicate	D	Water	6010B	
360-25577-7	OC-SW-18R-DUP	D	Water	6010B	
360-25577-8	OC-SW-ISCO1	D	Water	6010B	

Quality Control Results

Client: Olin Corporation

Job Number: 360-25577-1

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
---------------	------------------	--------------	---------------	--------	------------

Report Basis

D = Dissolved

T = Total

Quality Control Results

Client: Olin Corporation

Job Number: 360-25577-1

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
General Chemistry					
Analysis Batch:360-51614					
LCS 360-51614/10	Lab Control Sample	T	Water	SM 2510B	
MB 360-51614/3	Method Blank	T	Water	SM 2510B	
360-25577-1	OC-SW-ISCO3	T	Water	SM 2510B	
360-25577-1DU	Duplicate	T	Water	SM 2510B	
360-25577-2	OC-SW-ISCO2	T	Water	SM 2510B	
360-25577-3	OC-SW-PZ16RR	T	Water	SM 2510B	
360-25577-4	OC-SW-PZ17RR	T	Water	SM 2510B	
360-25577-5	OC-SW-SD17	T	Water	SM 2510B	
360-25577-6	OC-SW-18R	T	Water	SM 2510B	
360-25577-7	OC-SW-18R-DUP	T	Water	SM 2510B	
360-25577-8	OC-SW-ISCO1	T	Water	SM 2510B	
Analysis Batch:360-51682					
LCS 360-51682/4	Lab Control Sample	T	Water	300.0	
MB 360-51682/3	Method Blank	T	Water	300.0	
360-25577-1	OC-SW-ISCO3	T	Water	300.0	
360-25577-2	OC-SW-ISCO2	T	Water	300.0	
360-25577-3	OC-SW-PZ16RR	T	Water	300.0	
360-25577-4	OC-SW-PZ17RR	T	Water	300.0	
360-25577-5	OC-SW-SD17	T	Water	300.0	
360-25577-6	OC-SW-18R	T	Water	300.0	
360-25577-6MS	Matrix Spike	T	Water	300.0	
360-25577-6MSD	Matrix Spike Duplicate	T	Water	300.0	
360-25577-7	OC-SW-18R-DUP	T	Water	300.0	
360-25577-8	OC-SW-ISCO1	T	Water	300.0	
Analysis Batch:360-51684					
LCS 360-51684/4	Lab Control Sample	T	Water	300.0	
MB 360-51684/3	Method Blank	T	Water	300.0	
360-25577-1	OC-SW-ISCO3	T	Water	300.0	
360-25577-2	OC-SW-ISCO2	T	Water	300.0	
360-25577-3	OC-SW-PZ16RR	T	Water	300.0	
360-25577-4	OC-SW-PZ17RR	T	Water	300.0	
360-25577-5	OC-SW-SD17	T	Water	300.0	
360-25577-6	OC-SW-18R	T	Water	300.0	
360-25577-6MS	Matrix Spike	T	Water	300.0	
360-25577-6MSD	Matrix Spike Duplicate	T	Water	300.0	
360-25577-7	OC-SW-18R-DUP	T	Water	300.0	
360-25577-8	OC-SW-ISCO1	T	Water	300.0	

Quality Control Results

Client: Olin Corporation

Job Number: 360-25577-1

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
General Chemistry					
Prep Batch: 360-52128					
LCS 360-52128/2-A	Lab Control Sample	T	Water	Distill/Ammonia	
MB 360-52128/1-A	Method Blank	T	Water	Distill/Ammonia	
360-25577-1	OC-SW-ISCO3	T	Water	Distill/Ammonia	
360-25577-2	OC-SW-ISCO2	T	Water	Distill/Ammonia	
360-25577-3	OC-SW-PZ16RR	T	Water	Distill/Ammonia	
360-25577-4	OC-SW-PZ17RR	T	Water	Distill/Ammonia	
360-25577-5	OC-SW-SD17	T	Water	Distill/Ammonia	
360-25577-6	OC-SW-18R	T	Water	Distill/Ammonia	
360-25577-6MS	Matrix Spike	T	Water	Distill/Ammonia	
360-25577-6MSD	Matrix Spike Duplicate	T	Water	Distill/Ammonia	
360-25577-7	OC-SW-18R-DUP	T	Water	Distill/Ammonia	
360-25577-8	OC-SW-ISCO1	T	Water	Distill/Ammonia	
Analysis Batch:360-52157					
LCS 360-52128/2-A	Lab Control Sample	T	Water	L107-06-1B	360-52128
MB 360-52128/1-A	Method Blank	T	Water	L107-06-1B	360-52128
360-25577-1	OC-SW-ISCO3	T	Water	L107-06-1B	360-52128
360-25577-2	OC-SW-ISCO2	T	Water	L107-06-1B	360-52128
360-25577-3	OC-SW-PZ16RR	T	Water	L107-06-1B	360-52128
360-25577-4	OC-SW-PZ17RR	T	Water	L107-06-1B	360-52128
360-25577-5	OC-SW-SD17	T	Water	L107-06-1B	360-52128
360-25577-6	OC-SW-18R	T	Water	L107-06-1B	360-52128
360-25577-6MS	Matrix Spike	T	Water	L107-06-1B	360-52128
360-25577-6MSD	Matrix Spike Duplicate	T	Water	L107-06-1B	360-52128
360-25577-7	OC-SW-18R-DUP	T	Water	L107-06-1B	360-52128
360-25577-8	OC-SW-ISCO1	T	Water	L107-06-1B	360-52128

Report Basis

T = Total

Quality Control Results

Client: Olin Corporation

Job Number: 360-25577-1

Method Blank - Batch: 360-51587

Method: 6010B
Preparation: 3010A

Lab Sample ID: MB 360-51587/1-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 11/13/2009 1348
Date Prepared: 11/13/2009 0746

Analysis Batch: 360-51650
Prep Batch: 360-51587
Units: ug/L

Instrument ID: Varian 720 ES ICP
Lab File ID: N/A
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Result	Qual	MDL	RL
Aluminum	ND		39	100
Chromium	ND		1.3	5.0
Sodium	ND		250	2000

Lab Control Sample/ Lab Control Sample Duplicate Recovery Report - Batch: 360-51587

Method: 6010B
Preparation: 3010A

LCS Lab Sample ID: LCS 360-51587/2-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 11/13/2009 1351
Date Prepared: 11/13/2009 0746

Analysis Batch: 360-51650
Prep Batch: 360-51587
Units: ug/L

Instrument ID: Varian 720 ES ICP
Lab File ID: N/A
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

LCSD Lab Sample ID: LCSD 360-51587/3-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 11/13/2009 1354
Date Prepared: 11/13/2009 0746

Analysis Batch: 360-51650
Prep Batch: 360-51587
Units: ug/L

Instrument ID: Varian 720 ES ICP
Lab File ID: N/A
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	% Rec.		Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
	LCS	LCSD					
Aluminum	97	95	80 - 120	1	20		
Chromium	100	99	80 - 120	1	20		
Sodium	96	94	80 - 120	2	20		

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Olin Corporation

Job Number: 360-25577-1

Matrix Spike/

Matrix Spike Duplicate Recovery Report - Batch: 360-51587

Method: 6010B

Preparation: 3010A

MS Lab Sample ID: 360-25577-6
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 11/13/2009 1449
Date Prepared: 11/13/2009 0746

Analysis Batch: 360-51650
Prep Batch: 360-51587

Instrument ID: Varian 720 ES ICP
Lab File ID: N/A
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

MSD Lab Sample ID: 360-25577-6
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 11/13/2009 1452
Date Prepared: 11/13/2009 0746

Analysis Batch: 360-51650
Prep Batch: 360-51587

Instrument ID: Varian 720 ES ICP
Lab File ID: N/A
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	<u>% Rec.</u>		Limit	RPD	RPD Limit	MS Qual	MSD Qual
	MS	MSD					
Aluminum	96	101	75 - 125	4	20		
Chromium	97	101	75 - 125	4	20		
Sodium	78	105	75 - 125	6	20		

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Olin Corporation

Job Number: 360-25577-1

Method Blank - Batch: 360-51674

Method: 6010B
Preparation: N/A

Lab Sample ID: MB 360-51674/21
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 11/13/2009 1444
Date Prepared: N/A

Analysis Batch: 360-51674
Prep Batch: N/A
Units: ug/L

Instrument ID: Varian 720 ES ICP
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume: 1.0 mL

Analyte	Result	Qual	MDL	RL
Aluminum	ND		39	100
Chromium	ND		1.3	5.0
Sodium	ND		250	2000

Lab Control Sample/

Lab Control Sample Duplicate Recovery Report - Batch: 360-51674

Method: 6010B
Preparation: N/A

LCS Lab Sample ID: LCS 360-51674/20
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 11/13/2009 1441
Date Prepared: N/A

Analysis Batch: 360-51674
Prep Batch: N/A
Units: ug/L

Instrument ID: Varian 720 ES ICP
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume: 10 mL

LCSD Lab Sample ID: LCSD 360-51674/27
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 11/13/2009 1517
Date Prepared: N/A

Analysis Batch: 360-51674
Prep Batch: N/A
Units: ug/L

Instrument ID: Varian 720 ES ICP
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume: 10 mL

Analyte	% Rec.		Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
	LCS	LCSD					
Aluminum	94	98	80 - 120	5	20		
Chromium	97	100	80 - 120	2	20		
Sodium	95	98	80 - 120	3	20		

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Olin Corporation

Job Number: 360-25577-1

Matrix Spike/

Matrix Spike Duplicate Recovery Report - Batch: 360-51674

Method: 6010B

Preparation: N/A

MS Lab Sample ID: 360-25577-6
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 11/13/2009 1505
Date Prepared: N/A

Analysis Batch: 360-51674
Prep Batch: N/A

Instrument ID: Varian 720 ES ICP
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume: 10 mL

MSD Lab Sample ID: 360-25577-6
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 11/13/2009 1508
Date Prepared: N/A

Analysis Batch: 360-51674
Prep Batch: N/A

Instrument ID: Varian 720 ES ICP
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume: 10 mL

Analyte	<u>% Rec.</u>		Limit	RPD	RPD Limit	MS Qual	MSD Qual
	MS	MSD					
Aluminum	97	98	75 - 125	1	20		
Chromium	97	98	75 - 125	1	20		
Sodium	76	76	75 - 125	0	20	4	4

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Olin Corporation

Job Number: 360-25577-1

Method Blank - Batch: 360-51682

Method: 300.0
Preparation: N/A

Lab Sample ID: MB 360-51682/3
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 11/13/2009 1522
Date Prepared: N/A

Analysis Batch: 360-51682
Prep Batch: N/A
Units: mg/L

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 1.0 mL

Analyte	Result	Qual	RL	RL
Nitrate as N	ND		0.050	0.050
Nitrite as N	ND		0.010	0.010

Lab Control Sample - Batch: 360-51682

Method: 300.0
Preparation: N/A

Lab Sample ID: LCS 360-51682/4
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 11/13/2009 1538
Date Prepared: N/A

Analysis Batch: 360-51682
Prep Batch: N/A
Units: mg/L

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 1.0 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Nitrate as N	4.00	4.18	105	85 - 115	
Nitrite as N	4.00	4.06	101	85 - 115	

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Olin Corporation

Job Number: 360-25577-1

Matrix Spike/

Matrix Spike Duplicate Recovery Report - Batch: 360-51682

Method: 300.0

Preparation: N/A

MS Lab Sample ID: 360-25577-6
Client Matrix: Water
Dilution: 10
Date Analyzed: 11/13/2009 1623
Date Prepared: N/A

Analysis Batch: 360-51682
Prep Batch: N/A

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 10 mL

MSD Lab Sample ID: 360-25577-6
Client Matrix: Water
Dilution: 10
Date Analyzed: 11/13/2009 1638
Date Prepared: N/A

Analysis Batch: 360-51682
Prep Batch: N/A

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 10 mL

Analyte	<u>% Rec.</u>		Limit	RPD	RPD Limit	MS Qual	MSD Qual
	MS	MSD					
Nitrate as N	114	114	75 - 125	0	20		
Nitrite as N	108	108	75 - 125	0	20		

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Olin Corporation

Job Number: 360-25577-1

Method Blank - Batch: 360-51684

Method: 300.0

Preparation: N/A

Lab Sample ID: MB 360-51684/3
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 11/13/2009 1522
Date Prepared: N/A

Analysis Batch: 360-51684
Prep Batch: N/A
Units: mg/L

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 1.0 mL

Analyte	Result	Qual	RL	RL
Sulfate	ND		2.0	2.0
Chloride	ND		1.0	1.0

Lab Control Sample - Batch: 360-51684

Method: 300.0

Preparation: N/A

Lab Sample ID: LCS 360-51684/4
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 11/13/2009 1538
Date Prepared: N/A

Analysis Batch: 360-51684
Prep Batch: N/A
Units: mg/L

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 1.0 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Sulfate	80.0	83.7	105	85 - 115	
Chloride	40.0	40.7	102	85 - 115	

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Olin Corporation

Job Number: 360-25577-1

Matrix Spike/

Matrix Spike Duplicate Recovery Report - Batch: 360-51684

Method: 300.0

Preparation: N/A

MS Lab Sample ID: 360-25577-6
Client Matrix: Water
Dilution: 10
Date Analyzed: 11/13/2009 1623
Date Prepared: N/A

Analysis Batch: 360-51684
Prep Batch: N/A

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 10 mL

MSD Lab Sample ID: 360-25577-6
Client Matrix: Water
Dilution: 10
Date Analyzed: 11/13/2009 1638
Date Prepared: N/A

Analysis Batch: 360-51684
Prep Batch: N/A

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 10 mL

Analyte	<u>% Rec.</u>		Limit	RPD	RPD Limit	MS Qual	MSD Qual
	MS	MSD					
Sulfate	119	119	75 - 125	0	20		
Chloride	119	119	75 - 125	0	20		

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Olin Corporation

Job Number: 360-25577-1

Method Blank - Batch: 360-52128

Method: L107-06-1B

Preparation: Distill/Ammonia

Lab Sample ID: MB 360-52128/1-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 11/24/2009 1533
Date Prepared: 11/24/2009 1333

Analysis Batch: 360-52157
Prep Batch: 360-52128
Units: mg/L

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 50 mL

Analyte	Result	Qual	RL	RL
Ammonia	ND		0.10	0.10

Lab Control Sample - Batch: 360-52128

Method: L107-06-1B

Preparation: Distill/Ammonia

Lab Sample ID: LCS 360-52128/2-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 11/24/2009 1534
Date Prepared: 11/24/2009 1333

Analysis Batch: 360-52157
Prep Batch: 360-52128
Units: mg/L

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 50 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Ammonia	10.0	10.3	103	85 - 115	

Matrix Spike/

Matrix Spike Duplicate Recovery Report - Batch: 360-52128

Method: L107-06-1B

Preparation: Distill/Ammonia

MS Lab Sample ID: 360-25577-6
Client Matrix: Water
Dilution: 10
Date Analyzed: 11/24/2009 1617
Date Prepared: 11/24/2009 1333

Analysis Batch: 360-52157
Prep Batch: 360-52128

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 50 mL

MSD Lab Sample ID: 360-25577-6
Client Matrix: Water
Dilution: 10
Date Analyzed: 11/24/2009 1620
Date Prepared: 11/24/2009 1333

Analysis Batch: 360-52157
Prep Batch: 360-52128

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 50 mL

Analyte	<u>% Rec.</u>	MS	MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Ammonia		55	115	75 - 125	13	20	F	

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Olin Corporation

Job Number: 360-25577-1

Method Blank - Batch: 360-51614

Method: SM 2510B
Preparation: N/A

Lab Sample ID: MB 360-51614/3
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 11/13/2009 0854
Date Prepared: N/A

Analysis Batch: 360-51614
Prep Batch: N/A
Units: umhos/cm

Instrument ID: MAN-TECH Ion Plus
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume: 1.0 mL

Analyte	Result	Qual	RL	RL
Specific Conductance	ND		1.0	1.0

Lab Control Sample - Batch: 360-51614

Method: SM 2510B
Preparation: N/A

Lab Sample ID: LCS 360-51614/10
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 11/13/2009 0928
Date Prepared: N/A

Analysis Batch: 360-51614
Prep Batch: N/A
Units: umhos/cm

Instrument ID: MAN-TECH Ion Plus
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume: 1.0 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Specific Conductance	1410	1380	98	85 - 115	

Duplicate - Batch: 360-51614

Method: SM 2510B
Preparation: N/A

Lab Sample ID: 360-25577-1
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 11/13/2009 0931
Date Prepared: N/A

Analysis Batch: 360-51614
Prep Batch: N/A
Units: umhos/cm

Instrument ID: MAN-TECH Ion Plus Autotitrant
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume: 1.0 mL

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Specific Conductance	650	650	0	20	

Calculations are performed before rounding to avoid round-off errors in calculated results.

State Accreditation Matrix

Method Name	Description	State where Primary Accreditation is Carried				
		New York (NELAC)	Mass	Conn	Florida (NELAC)	North Carolina
821-R-02-012	Toxicity, Acute (48-Hour)(list upon request)				NP	
SM 4500 Cl F	Chlorine, Residual		NP			
SM 9215B	Heterotrophic Plate Count (Pour Plate Method)		P			
SM 9215E	Heterotrophic Plate Count (SimPlate)		P			
SM 9221F	E.Coli (Multiple-Tube Fermentation; EC-MUG)		P			
SM 9222B	Coliforms, Total (Membrane Filter)		P			
SM 9222D	Coliforms, Fecal (Membrane Filter)		P/NP			
SM 9223	Coliforms, Total, and E.Coli (Colilert-P/A)		P			
200.8	Metals (ICP/MS) (list upon request)	NP/P	NP/P	NP/P		
200.7 Rev 4.4	Metals (ICP)(list upon request)	NP/P	NP/P	NP/P		
6010B	Metals (ICP)(list upon request)	NP/SW		NP/SW		
245.1	Mercury (CVAA)	NP/P	NP	NP/P		
7470A	Mercury (CVAA)	NP		NP		
7471A	Mercury (CVAA)	SW		SW		
SM 2340B	Total Hardness (as CaCO3) by calculation	NP/P	NP	NP/P		
3005A	Preparation, Total Recoverable or Dissolved Metals	NP/P		NP/P		
3010A	Preparation, Total Metals	NP/P		NP/P		
3020A	Preparation, Total Metals	NP/P/SW		NP/P/SW		
3050B	Preparation, Metals	SW		SW		
504.1	EDB, DBCP and 1,2,3-TCP (GC)		P	P		
608	Organochlorine Pest/PCBs (list upon request)	NP	NP	NP		
625	Semivolatile Org Comp (GC/MS)(list upon request)	NP		NP		
3546	Microwave Extraction	SW				
3510C	Liquid-Liquid Extraction (Separatory Funnel)	NP		NP		
3540C	Soxhlet Extraction					
3550B	Ultrasonic Extraction	SW		SW		
600/4-81-045	Polychlorinated Biphenyls (PCBs) (GC)		NP	NP		
8081A	Organochlorine Pesticides (GC)(list upon request)	NP/SW		NP/SW		
8082A	PCBs by Gas Chromatography(list upon request)	NP/SW		NP/SW		
8270C	Semivolatile Comp.(GC/MS)(list upon request)	NP/SW		NP/SW		
CT ETPH	Conn - Ext. Total petroleum Hydrocarbons (GC)			NP/SW		
MA-EPH	Mass - Extractable Petroleum Hydrocarbons (GC)			NP/SW		NP/SW
524.2	Volatile Org Comp (GC/MS)(list upon request)	P	P	P		
524.2	Trihalomethanes		P	P		
624	Volatile Org Comp (GC/MS)(list upon request)	NP	NP	NP		
5035	Closed System Purge and Trap	SW		SW		
5030B	Purge and Trap	NP		NP		
8260B	Volatile Org Comp. (GC/MS)(list upon request)	NP/SW		NP/SW		
MAVPH	Mass - Volatile Petroleum Hydrocarbons (GC)			NP/SW		NP/SW
180.1	Turbidity, Nephelometric		P	P		
300	Anions, Ion Chromatography	NP/P	NP/P	NP/P		
410.4	COD	NP	NP	NP		
1010	Ignitability, Pensky-Martens Closed-Cup Method	SW		SW		
10-107-06-2	Nitrogen, Total Kjeldahl	NP	NP	NP		
7196A	Chromium, Hexavalent	NP/SW		NP/SW		
9012A	Cyanide, Total and/or Amenable	NP/SW		NP/SW		
9030B	Sulfide, Distillation (Acid Soluble and Insoluble)	NP		NP		
9040B	pH	NP		NP		
9045C	pH	SW		SW		
L107041C	Nitrogen, Nitrate	NP	P	NP/P		
L107-06-1B	Nitrogen Ammonia	NP	NP	NP/P		
L204001A CN	Cyanide, Total		NP/P	NP/P		
L210-001A	Phenolics, Total Recoverable	NP	NP	NP		
SM 2320B	Alkalinity	NP/P	NP/P	NP/P		
SM 2510B	Conductivity, Specific Conductance	NP/P	NP/P	NP/P		
SM 2540C	Solids, Total Dissolved (TDS)	NP/P	NP/P	NP/P		
SM 2540D	Solids, Total Suspended (TSS)	NP	NP	NP		
SM 3500 CR D	Chromium, Hexavalent	NP		NP		
SM 4500 H+ B	pH	NP/P	NP/P	NP/P		
SM 4500 NO2 B	Nitrogen, Nitrite	NP	P	NP/P		
SM 4500 P E	Phosphorus, Orthophosphate	NP/P	NP	NP/P		
SM 4500 P E	Phosphorus, Total	NP	NP	NP		
SM 4500 S2 D	Sulfide, Total	NP		NP		
SM 5210B	BOD, 5-Day	NP	NP	NP		
SM 5310B	Organic Carbon, Total (TOC)	NP	NP	NP/P		

Not all organic compounds are accredited under NELAC

For methods with multiple compounds all compounds may not meet NELAC criteria, listing should be obtained from the laboratory

The lab carries additional accreditations with several states. This is listing is subject to change based on the laboratories current certification standing.

Login Sample Receipt Check List

Client: Olin Corporation

Job Number: 360-25577-1

Login Number: 25577

List Source: TestAmerica Westfield

Creator: Rinard, Kimberley A

List Number: 1

Question	T / F / NA	Comment
Radioactivity either was not measured or, if measured, is at or below background	N/A	
The cooler's custody seal, if present, is intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	0.6 C / 1.2 C / 5.2 C
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	N/A	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Is the Field Sampler's name present on COC?	True	
Sample Preservation Verified	True	

[illegible]